RHYNCHOPHORA BEETLES OF THE NEVADA TEST SITE[1]

by

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INTRODUCTION

It is interesting to contemplate the progress that is taking place in the accumulation of information and understanding of the large and interesting group of snout beetles, the Rhynchophora. Following the major contributions made by LeConte, Horn, Say, Casey, Blatchley, Leng, Fall, Schaeffer, and Dietz, there was a decided lull and lack of interest in the study of the weevils. Within the past 30 years, however, many new workers have been attracted to the study of the Curculionidae of this country. Attention has been turned to careful curating and amassing in permanent collections of the old and newly collected specimens of Nearctic species. Major contributions by recent workers which must be consulted when studying this insect complex have been made by such authorities, to name a few, as Pierce, Van Dyke, Buchannan, Ting, Sleeper, Warner (Mrs. Spilman), Kissinger, Burk, Gilbert, and Anderson.

Two timely and useful recent contributions are Arnett's "The Beetles of the United States, A Manual for Identification," and Kissinger's "Curculionidae of America North of Mexico, A Key to the Genera 1964." These bring together and make available information on the weevils that will greatly facilitate research work on this difficult group.

There is great need for careful internal as well as external morphological studies of the weevil genera. Without doubt, the more than 3,600 genera can be reduced in number and a better understanding of their phylogeny brought to light. Too little is known about the immature stages and food habits of the United States weevils. It is the aim of this study to classify those collected at the Nevada Test Site (Fig. 11) according to latest available studies and to report their seasonal abundance and plant hosts. No special effort was made to collect Rhynchophora; only specimens that were trapped along with other insects or were occasionally taken from plants came into this collection. The collecting extended from autumn, 1959 to and including the summer of 1965. A total of 310 specimens representing 28 genera and 44 species was collected.

The fauna of this southern portion of the Great Basin is typically Sonoran in its insect elements. The summers are hot and long; whereas the winters are mild and short. Allred, Beck, and Jorgensen (1963a) reported temperatures of 112° F in July. Van Dyke (1939) pointed out that the Sonoran fauna is a peculiar one, well adapted to its environment. The dominant groups of insects in this fauna are such coleopterous families as the Tenebrionidae or darkling beetles (Tanner and Packham, 1965), the Meloidae or blister beetles, and somewhat related Alleculidae and Oedemeridae, and a certain large element of broad-nosed weevils like the Brachyrhinae (Otorhynchinae) as well as numerous genera of Buprestidae or jewel beetles. Other dominant insects than the beetles which favor these areas are the Bombyliidae or bee flies (Allred, Johnson, and Beck, 1965) and the Asilidae or robber flies among the Diptera. The great portion of the adult beetles are nocturnal, burying themselves in the soil during the day, and most of their larvae are subterranean in habit. Many of the nocturnal forms are somber in color or with very little color, the diurnal forms often gray and many of them very hairy, as is true of many desert plants. Though so very distinct and highly modified, I am convinced that most of this fauna has been derived from the Neotropical or South American fauna. Species of the tribe Anthonomini which live mainly in the flowers, fruits, and seeds of plants are well represented.

The plant communities of the test site were determined and discussed by Allred, Beck, and Jorgensen (1963a, 1963b). They used two major types of vegetation at the test site which they divided into plant communities (Fig. 12). The Desert Scrub type was divided into the Larrea-Franseria, Gravia-Lycium, Coleogyne, Atriplex-Kochia, and Salsola communities. The Desert Woodland type was designated as one community, the Pinyon-Juniper. Some areas were not typical of the above plant communities, and

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Allred *et al.* proposed that mountain areas, natural springs, reservoirs, and playas be grouped together as mixed communities.

In this study the weevil species are discussed under plant relationships, and the number of specimens collected, month and year of collection, and plant host or plant communities where collected are given. Specimens taken in can traps are related only to the plant community where trapped. This may not be entirely accurate since it does not account for the flight or movement of the specimens from contiguous areas.

Very little information, if any, on the life history of species of this study was obtained.

ACKNOWLEDGMENTS

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LIST OF THE SPECIES

Two families of the Rhynchophora are represented. In the main I have followed Kissinger's (1964) taxonomic proposals as to subfamilies, tribes, and genera of the Curculionidae. He made a number of major changes in the subfamily and tribal sequence. This departure from the Leng Catalogue and Bradley Manual arrangement of higher categories will no doubt, if followed, be reflected in a new catalogue of the North American Coleoptera. I agree with the way Kissinger has dealt with the Otiorhynchinae of Leng. The new arrangement of the genera is far more natural and morphologically sound.

I have made use of the keys and of the genus and species characterizations of previous contributors to our knowledge of the species included in this study. The labeled drawing of *Calendra ochrens* Lec. (Fig. 1) may be useful in interpreting the morphological terms used in the keys and descriptions.

Family PLATYSTOMIDAE (ANTHRIBIDAE)

Subfamily Anthribinae

Tribe Anthribini

Trigonorhinus irregularis (Tanner)

Family CURCULIONIDAE

Subfamily Brachyrhininae

Tribe Peritelini

Thinoxenus nevadensis Casey
Thricolepis inornata Horn
Eucyllus vagans Horn
Eucyllus unicolor Van Dyke
Aragnomus hispidulus Casey

Subfamily Thylacitinae

Tribe Baryotini

Cryptolepidus leechi Ting

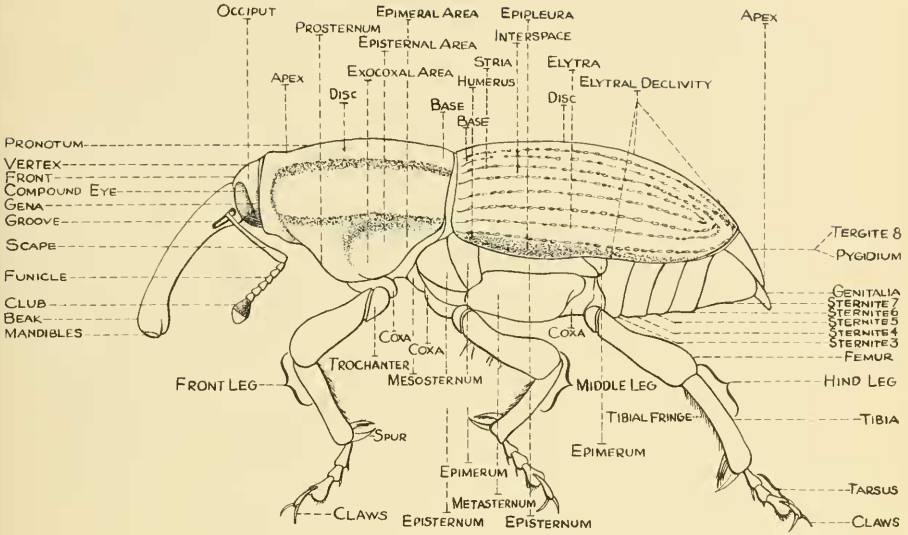

Fig. 1. *Calendra ochreus*, general morphology

Cryptolepidus nevadicus (Van Dyke)
Cryptolepidus aridus, new species
Cryptolepidus cazieri (Van Dyke)

Subfamily Leptopiinae
Tribe Ophryastini

Ophryastes varius (LeConte)
Ophryastes geminatus Horn

Tribe Leptopiini

Orinodema protracta Horn
Paracimbocera atra Van Dyke
Paracimbocera artemisiae Ting
Miloderes mercuryensis, new species
Dirotognathus sordidus Horn

Subfamily Cleoninae

Cleonus denticollis Casey
Cleonus lobigerinus Casey

Subfamily Erirhininae
Tribe Smicronychini

Smicronyx imbricatus (Casey)
Smicronyx sp.
Promecotarsus densus Casey

Subfamily Apioninae

Apion varicorne Smith

Subfamily Rhynchitinae

Auletobius humeralis Boheman
Auletobius sp.

Subfamily Myrmecinae

Myrmex lineata (Paseoe)

Subfamily Magdalinae
Tribe Magdalini

Magdalis lecontei subsp. *tenebrosa* Fall

Subfamliy Anthonominae
Tribe Anthonomini

Macrorhoptus hispidus Dietz
Anthonomus peninsularis Dietz
Anthonomus haematopus subsp. *confusus* Dietz
Anthonomus ornatulus Dietz
Anthonomus hirtus LeConte
Anthonomus sphaeralceae Fall
Anthonomus cycliferus Fall
Anthonomus tenuis Fall
Epimechus gracilis Fall
Brachyogmus ornatus Linell

Subfamily Tychiinae
Tribe Tychiini

Tychius prolixus Casey

Subfamily Cryptorhynchinae
Tribe Cryptorhynchini
Zascelis irrorata LeConte

Subfamily Ceutorhynchinae
Tribe Ceutorhynchini
Ceutorhynchus adjunctus Dietz
Ceutorhynchus tescorum Fall

Subfamily Baridinae
Tribe Madarini
Onychobaris mystica Casey
Onychobaris near *depressa* Casey

Subfamily Rhynchophorinae
Tribe Sipalini
Yuccaborus frontalis (LeConte)

KEY TO THE FAMILIES OF RHYNCHOPHORA OF THE NEVADA TEST SITE

Rostrum broad, flat, short, never separated from the front by a transverse impression. Labrum present. Antennae usually inserted under the sides of the front, slender, straight; segments 9 to 11 broader, more or less compressed, rarely forming a compact club. Labial palpi of three segments, slender, longer than in other Rhynchophora, the last segment of all palpi elongate. Base of pronotum always with a transverse elevated ridge. Pygidium exposed; notched to receive sutural apex of elytra. Middle coxal cavities broadly closed by sterna. Tarsi brushlike beneath, of four segments; the second emarginate, triangular; the third small, bilobed ..... Anthribidae

Rostrum variable in length, often long and curved downwards. Palpi short, rigid, nearly always concealed within the mouth. Head usually spherical. Antennae generally geniculate with a three-segmented club, usually ringed. Front coxal cavities closed behind. Elytra usually with a strong fold on the underside, limiting a deep groove into which the upper edge of the abdomen fits. Epipleura wanting. Five sternites, the first two closely united. Front and middle coxae rounded, the hind pair oval ..... Curculionidae

KEY TO THE SUBFAMILIES OF ANTHRIBIDAE OF THE NEVADA TEST SITE
(From Bradley, 1930, and Arnett, 1962)

Antennae inserted on the sides of the rostrum (Brachytarsinae) ..... Anthribinae

Antennae inserted on the front of the head, or dorsally at the base of the rostrum. Pronotal ridge basal ..... Choraginae

Tribe Anthribini

Since only one species of this family is included in this study, the tribe Anthribini to which it is assigned may be briefly characterized as follows: Antennae inserted on the sides of the rostrum; transverse ridge situated at the base, the surface behind it perpendicular.

KEY TO THE SUBFAMILIES OF CURCULIONIDAE OF THE NEVADA TEST SITE
(After Kissinger, 1964)

1. Trochanter long and somewhat cylindrical. Femur attached to apex of trochanter; base of femur distant from coxa. Antenna straight; funiculus with seven segments, segments 6 and 7 distinctly narrower than club ..... Apioninae

   Trochanter short and triangular. Femur attached to side of trochanter; base of femur closely adjacent to coxa 2

2. Antenna straight; rostrum generally lacking conspicuous scrobe to receive antenna. Prothorax not margined; elytra concealing tergites 1-5 3

   Antenna distinctly elbowed between scape and funicular segment 1; rostrum generally with apparent scrobe to receive scape of antenna. Tarsus with four distinct segments. Funiculus consisting of five to eight segments 6

3. Antenna with eleven segments, including distinct club composed of three segments. Prothorax not pedunculate at base. Mandible flattened, toothed on outer margin. Claw with basal process ..... Rhynchitinae

Rostrum not received into prosternal emargination, or, prosternum not a triangular plate in front of procoxae and rostrum usually slender and longer than head or tarsal claws toothed at base. Tarsal segment 3 usually strongly bilobed 4

4. Mandible lacking deciduous cusp, not scarred, either glabrous on lateral aspect or with few minute setae; mandible usually small in size. Rostrum slender, generally longer than prothorax; if rostrum shorter than prothorax then frons and rostrum lacking deep, median longitudinal groove, and scape not obviously extending beyond anterior margin of eye. Prothorax with margin more or less truncated, margin not produced into rounded lobe behind the eye; eye usually distant from anterior margin of prothorax, slightly round in outline. Prothorax lacking long setae projecting anteriorly from front margin adjacent to eye 5

Mandible with prominent scar indicating point of attachment of deciduous cusp, or else clothed laterally with many fine scales or setae; mandible large in size. Rostrum stout, quadrate in form, shorter than prothorax, rarely longer, often expanded laterally toward apex. Prothorax with anterior margin produced into prominent, rounded lobe adjacent to eye; eye usually partly covered by anterior margin of prothorax, mainly transverse in shape. Mandible with four or more large setae ..... Leptopiinae

5. Antennal scrobe vaguely defined posteriorly; scape usually passes over middle of eye when retracted next to head ..... Brachyrhininae

Antennal scrobe lateral, dorsal margin sharply defined, ventral and dorsal boundaries strongly bent ventrally so that scape usually rests below eye when retracted next to head ..... Thylacitinae

6. Scape not extending beyond hind margin of eye, generally fitting into scrobe; antenna generally inserted toward apex of rostrum; club uniformly clothed with erect, fine, short setae, first segment with distinct setae; if first segment is bare then funiculus with seven segments or prosternum with apical channel 7

Scape stout and long, projecting some distance past posterior margin of eye, not fitting into short antennal scrobe; inserted close to eye (exception to preceding statement: *Yuccaborus*); funiculus six segments, first segment of club large, virtually glabrous and polished. Large uncus on tibia 3 projects from anterior margin. Prosternum not channeled. Hind tarsal segment not bilobed (except *Yuccaborus*). Pygidium of male resembles that of female ..... Rhynchophorinae

7. Rostrum free, not received into deep, median sternal channel 8

Rostrum received into deep, median sternal channel in repose. Funiculus with six or seven segments. Eyes partially covered by prothoracic postocular lobes when rostrum is in repose. Pygidium covered by elytra. Tibia 1-3 armed with an uncus. Antennal club rather evenly clothed with pubescence. Tibia 3 with distinct apical comb of setae. Body lacking dense varnishlike coating. Tarsal segment 3 bilobed, usually distinctly wider than segments 1 and 2. Front coxae obviously separated by prosternum or claws toothed or connate ..... Cryptorhynchinae

8. Mesepimeron not ascending and not visible in dorsal view 10

   Mesepimeron strongly ascending, truncated by elytral humeri and visible in dorsal view between prothorax and elytra; elytra not produced anteriorly over base of prothorax 9

9. Funiculus with seven segments. Claws simple, free, connate or with a single claw ..... Baridinae

   Funiculus with six segments. Claw simple or toothed ..... Ceutorhynchinae

10. Front coxae contiguous, not separated by process of prosternum 11

    Front coxae separated by complete process of prosternum; separation may be slight. Sterna unequal in length, 2 about as long or longer than 3 and 4. Claws simple. Tibia 3 definitely uncinate, praemucro if present small, less than one-half as long as uncus. Eyes narrowly separated by frons which is not wider than maximum diameter of club. Femur 1 toothed, sometimes strongly so. Elytra broadly exposing pygidium; elytra black, usually with a reddish area, lacking obvious vestiture. Tooth on femur 1 small and acute. Rostrum nearly subcylindrical. Metepimeron visible ..... Magdalinae

11. Suture between sterna 2 and 3 nearly straight, at most slightly produced backwards laterally, not reaching suture between sterna 3 and 4 12

    Suture between sterna 2 and 3 strongly produced backwards laterally, reaching or passing suture between sterna 3 and 4. Claw with basal process. Hind coxa distant from margin of elytra. Rostrum definitely tapered apically ..... Tychiinae

12. Claws connate at base. Funiculus with seven segments. Elytron lacking acute subhumeral tubercle. Tibia lacking angulation on inner surface near middle 13

    Claws free at base, simple, lacking basal process; sterna unequal in length. Front tibia with apex not produced into elongate, flat paddle; tibia 3 unarmed at apex or mucronate, mucro not more than one-half as long as claw; eyes well developed 14

13. Eye distant from anterior margin of prothorax; anterior margin of prothorax with long postocular vibrissae and not produced into postocular lobe. Vestiture fine, hairlike. Metepimeron visible, punctured and scaly at metepisternum ..... Cleoninae

    Eye partially concealed by postocular lobe of anterior margin of prothorax; long postocular vibrissae absent. Rostrum obviously more slender than maximum width of femur 2, usually separated from frons by erect group of scales and transverse impression. Elytra usually with round or narrow scales. Eyes usually not contiguous ventrally ..... Erirhininae

14. Rostrum long and slender, more or less glabrous; width at insertion of antenna (in lateral view) much less than width of eye; rostrum longer than prothorax; eyes nearly round (subfamily in part) ..... Anthonominae

    Rostrum stout, front coxae much closer to hind margin of prosternum than front margin, distance to front margin not less than two times as great as distance to hind margin; prothorax longer than wide, globose in middle, base much narrower than middle; tibia 3 uncinate; frons narrower than diameter of antennal club; scrobe directed toward ventral aspect of rostrum; body nearly glabrous (subfamily in part) ..... Myrmecinae

SYSTEMATIC AND ECOLOGICAL DISCUSSION

Family Anthribidae
Subfamily Anthribinae
Tribe Anthribini

Genus *Trigonorhinus* Wollaston

Reference. Wollaston, 1861:102.

Morphological characteristics. Genus *Trigonorhinus*. Valentine (1960), a specialist on this family, pointed out that the generic characteristics of this genus may be recognized in all the species assigned to the genus ". . . by their rostrum, the dorsal surface of which is progressively narrowed from base to apex, and by the shape of the apex itself which has the central portion distinctly produced beyond the corners and slightly emarginate. . . . The lobes of the third tarsal segment are separate, thus this segment appears profoundly emarginate. . . . Species of this genus are plant feeders like the majority of the family."

Trigonorhinus irregularis (Tanner)
Fig. 2

References. Tanner, 1934:285-286. Valentine, 1960:41-85.

Morphological characteristics. Form robust oval. Covered with loose whitish pubescence, except for brown checkering of prothorax and elytra. Head and rostrum blackish; mandible rufescent with whitish pubescence extending down over base of mandibles; labium distinct, brown and glabrous; eyes but slightly emarginate; scrobes reaching eye, antennal carina prominent, extending from upper margin of eye to base of mandible. Antennae rufescent, except segments of club which are brownish black; first two segments about equal; segments three to eight equal, but only about one-third as wide as first two; segments of club as long as segments three to eight. Prothorax wider than long; lateral carina extending forward only about one-third length of prothorax; decumbent coarse pubescence covers surface; distinct brownish spots on disc. Elytra wider at base than prothorax, with conspicuous brown patches of pubescence surrounded by white elongate scales. Legs rufescent and evenly covered with white pubescence; claws widely divergent with small tooth, about equidistant on claw. Under surface of the body covered with white scales. Length 1.9 mm, width 1.3 mm.

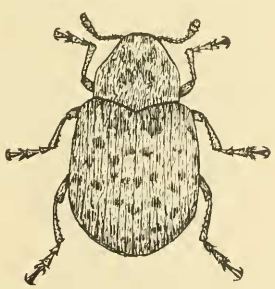

Fig. 2. *Trigonorhinus irregularis*, dorsal view

Plant relationship. One specimen was collected in July, 1965, on *Franseria acanthicarpa* in Area 17.

Comments. This species was described originally in the genus *Brachytarsoides* (Pierce, 1930) which was recently made a synonym of *Trigonorhinus* (Wollaston, 1961) by Valentine (1960); hence, the new combination.

In 1954, Dethlefsen described several species of *Trigonorhinus* from California and Nevada. I have been unable to relate *Trigonorhinus irregularis* to any of the species discussed in his paper. *Trigonorhinus nevadensis* agrees to some extent in color and pubescence, but it is much larger than *T. irregularis*. The species of this genus will no doubt be critically dealt with in the near future by Valentine, who is well prepared to do so.

Family Curculionidae
Subfamily Brachyrhininae
Tribe Peritelini

Genus *Thinoxenus* Horn

Reference. Horn, 1876:74.

Morphological characteristics. Genus *Thinoxenus* with mesopleural sclerites unequal, episternum larger and attaining elytra; first ventral suture arcuate; cotyloid surface of the hind tibiae squamose; scrobes lateral, not convergent, very shallow, not attaining the eyes; scape feebly arcuate.

Thinoxenus nevadensis Casey
Fig. 3

Reference. Casey, 1888:267.

Morphological characteristics. Casey described *Thinoxenus nevadensis* as an oblong-elongate convex species, clothed with small, rounded, dark brown scales; abdomen covered

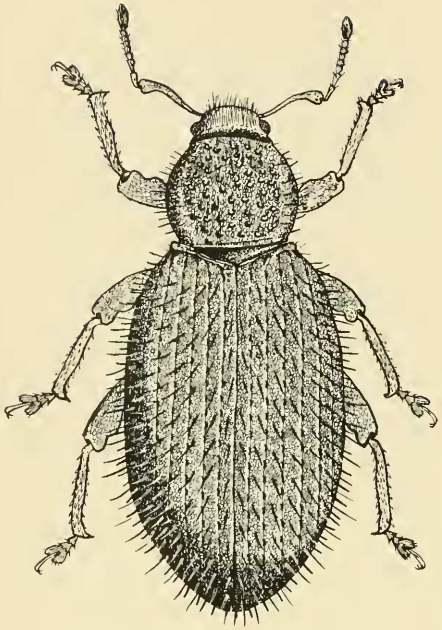

Fig. 3. *Thinoxenus nevadensis,* dorsal view

with crust of similar scales, intermixed with squamiform hairs. Head and rostrum conical, flattened; rostrum with short median stria in basal half; eyes small, very distant on sides; scrobes widely distant, narrow and deep near apex; antennae inserted nearly at apices of scrobes; first joint of funicle one-half longer than second. Prothorax one-half wider than long, wider than head; disc not densely punctate. Elytra emarginate at base; sides nearly straight and parallel; feebly striate. First ventral suture strongly arcuate; second segment as long as next two together. Legs densely squamose, with short semi-erect hairs. Length 5 mm, width 3.0 mm.

Plant relationship. One specimen was taken in a Pinyon-Juniper community, Area 12, in August, 1964.

Genus *Thricolepis* Horn

Reference. Horn, 1876:68).

Morphological characteristics. This genus is common throughout the Great Basin region. It has the following characteristics according to Pierce (1909): side pieces of mesosternum unequal, episternum large and attaining elytral margin, epimeron usually small; first ventral suture arcuate; cotyloid surface of hind tibiae glabrous; integument squamose; scrobes superior, convergent above; rostrum narrowed to tip, longer than head; scrobes very short, terminal.

Thricolepis inornata Horn

Reference. Horn, 1976:68-69.

Morphological characteristics. *Thricolepis inornata*, one of the three species of this genus found on the oaks, is common along the Wasatch Front and in the Great Basin. It has the following distinguishing characteristics: form oval and robust, head and rostrum larger than thorax, surface sparsely punctured and not densely scaly. Antennae prominent, rufotestaceous. Prothorax cylindrical, slightly wider than long, with deep punctures, sparsely scaly and with erect hairs. Elytra about three times as long as thorax, with closely placed punctures, intervals flat, short black erect setae, scales of pearly luster, and body surface black and shining. Length 3.6 mm, width 2 mm.

Plant relationship. One specimen was taken from *Quercus gambelii*, Area 12, in August, 1965.

Genus *Eucyllus* Horn

Reference. Horn, 1876:74.

Morphological characteristics. Genus *Eucyllus* with first ventral suture arcuate, cotyloid surface of hind tibiae squamose; scape arcuate, slightly twisted; scrobes lateral, not convergent, deep, attaining the eyes.

Specimens representing two species of this genus were collected at the test site. Van Dyke (1936:31-32) prepared the following key to separate the species of *Eucyllus*:

1. Larger species, 5.5 to 7.5 mm in length; bicolored; second funicular segment from three to four times as long as broad; setae of entire upper surface hispid, many times as long as broad and acute at apices ..... *vagans* Horn

   Smaller species, 5 mm or less in length; second funicular segment but little more than twice as long as broad; setae of upper surface very short and robust, squamose or club-like and blunt at apices 2

2. Bicolored, three brown stripes on pronotum and numerous brown patches on elytra; erect setae of upper surface club-like, several times as long as broad ..... *echinus* Van Dyke

Unicolored, cinereous; erect setae of upper surface peg-like or tubercular; but little longer than broad ..... *unicolor* Van Dyke

Eucyllus vagans Horn

Fig. 4

Reference. Horn, 1876:75.

Morphological characteristics. *Eucyllus vagans* is an elongate oval species, densely clothed with scales and grayish setiform hairs. Head and rostrum not as long as thorax, covered with cinereous and pale-brownish scales intermixed, and short erect hairs; prothorax cylindrical, slightly wider than long, disc sparsely punctured, densely scaly and with some hairs. Elytra twice as long as wide, finely striate, fine punctures on the striae, intervals flat; long erect hairs on each interval. Venter of body scaly, with some short setae. Legs with cinereous scales; femora with dark ring near tip. Length 7 mm, width 3 mm.

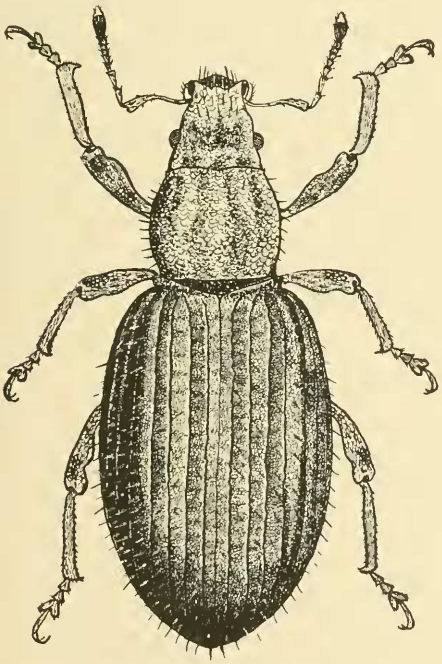

Fig. 4. *Eucyllus vagans*, dorsal view

Plant relationships. A total of 42 specimens was collected, mostly during 1961 (Table 1).

Table 1. Collection records of *Eucyllus vagans* at the Nevada Test Site.

Area	Plant Host° or Community	Month and Number of Specimens
1	Grayia-Lycium	April 1, May 2
5	Larrea	May 1, June 1, Sept. 2, Oct. 3, Nov. 3
	Lycium	Sept. 2, Nov. 1
6	Mixed	Nov. 1
10	Coleogyne	April 1, Aug. 1, Oct. 1, Nov. 1
12	Grayia-Lycium	June 1
	Pinyon-Juniper	Aug. 1
16	°*Eurotia lanata*	June 1
23	Mixed	Oct. 6, Nov. 6
28	Mixed	Feb. 2, Oct. 1, Nov. 1
Cane Springs	Mixed	May 1, Oct. 1

Eucyllus unicolor Van Dyke

Reference. Van Dyke, 1936:32.

Morphological characteristics. *Eucyllus unicolor* is a small species, unicolored, lacking brown stripes common to other two species, cinereous with erect setae which are peg-like or tubercular. Prothorax with sides less broadly rounded, elytra narrower with striae deeper and with closer punctures. Length 4.9 to 5.1 mm, width 2 to 2.1 mm.

Plant relationships. Four specimens were taken from a mixed community, Area 28, and two from Cane Springs (a mixed community), all in September and October, 1961.

Genus *Aragnomus* Horn

Reference. Horn, 1876:72.

Morphological characteristics. *Aragnomus*, a genus related to the genera *Thricolepis*, *Eucyllus*, and *Thinoxenus*, is distinctive because of an arcuate ventral suture. Cotyloid surface of hind tibiae glabrous; integument squamose; scrobes more lateral, not convergent above, and scape much shorter than flagellum.

Aragnomus hispidulus Casey

Reference. Casey, 1888:266.

Morphological characteristics. *Aragnomus hispidulus* is robust, covered with rounded, pale brown scales. Head wider than rostrum; rostrum longer than wide and dilated at tip. Antennal scrobes lateral, deep, nearly straight, but not reaching eyes; scape extending beyond anterior margin of prothorax, shorter than flagellum. Prothorax one-half wider than long, sides parallel, finely and sparsely punctate, each puncture with erect scale. Elytra slightly inflated, declivous at apex; one-third longer than wide, middle much wider than prothorax. Legs short and well covered with short erect scales. Length 5.5 mm, width 2.7 mm.

Plant relationships. Twenty-five specimens were collected, mostly during 1962 (Table 2).

Table 2. Collection records of *Aragnomus hispidulus* at the Nevada Test Site.

Area	Plant Host° or Community	Month and Number of Specimens
2	°*Coleogyne ramosissima*	Jan. 1, April 1
4	°*Grayia spinosa*	Nov. 1
5	°*Larrea divaricata*	May 1
12	Pinyon-Juniper	July 14, Aug. 7

Subfamily Thylacitinae
Tribe Barynotini
Genus *Cryptolepidus* Van Dyke

Reference. Van Dyke, 1936:91.

Morphological characteristics. Kissinger (1964) placed *Cryptolepidus* in the subfamily Thylacitinae which he characterized as follows: claws free; eyes in part encroaching upon dorsal area of head, frons narrower than rostrum; frons and dorsal surface of rostrum lacking deep median sulcus, with at most a broad, shallow, longitudinal depression; rostrum separated from frons by distinct transverse furrow or depression; dorsal aspect of tarsal segments with scales, tarsi clothed ventrally with coarse setae. Mentum concealing maxillae; frons lacking distinct tubercle above eye; eye visible in dorsal view; elytra with suberect, fine, acute setae.

The genus *Cryptolepidus* includes six species confined to southern California, Nevada, and Arizona. The main generic characters are no pubescence on ventral surface of tarsal segments, only bristle-like setae present. Third tarsal segment only slightly, if at all, larger than second. Postocular prothoracic lobes and vibrissae absent. Antennal scrobes deep and only slightly widened at posterior end.

Four species are known for Nevada and the test site. The following key modified from Ting's (1940)) study will separate them.

KEY TO SPECIES OF CRYPTOLEPIDUS

1. Elytral setae short and reclinate, not longer than one-fourth to one-half width of intervals; head slightly convex between eyes; pronotal sides faintly convex ..... *leechi* Ting

   Elytral setae long and suberect, as long or longer than width of intervals; head between eyes flat or concave; pronotal sides strongly convex 2

2. Pronotum not tuberculate or rugose 3

   Pronotum distinctly tuberculate and rugose 4

3. Base of rostrum with broad, somewhat arcuate, transverse constriction; pronotum as broad as long; elytral intervals flat; fore tibiae with six spinules and pale colored mucro at apex, exclusive of those in ventral comb ..... *nevadicus* (Van Dyke)

   Base of rostrum with well-defined basal constriction, with median longitudinal groove free from scales; head one-third wider than rostrum at base; corbel spinules amber, widely spaced, six in anterior, eight in mesothoracic tibial comb; setae white to golden, long, three times width of elytral intervals, sparsely placed, none on medial discal area, short on head and rostrum; antennal club reddish-brown; scales silvery; size 4 to 4.5 mm ..... *aridus* new species

Base of rostrum flat; pronotum one-fourth wider than long; elytral intervals slightly convex; fore tibiae with eleven spinules and black mucro at apex, exclusive of those in ventral comb . . . . . *planifrons* Ting

4. Dorsum of rostrum longitudinally convex between base and subapical area; median sulcus narrow, line-like; color brown . . . . . *cazieri* (Van Dyke)

Dorsum of rostrum longitudinally flat; median sulcus broad; color grey . . . . . *rugicollis* Ting

Cryptolepidus leechi Ting

Reference. Ting, 1940:147.

Morphological characteristics. Moderately elongate, clothed with white, imbricate, circular and ovate scales; rostrum with faint basal transverse constriction; narrow median sulcus; setae sparse and same length as those on head; subapical area with V-shaped glabrous region back of nasal plate. Head with area between eyes slightly convex. Prothorax with broad apical constriction; broader than long; disc punctate, but covered by crust of white scales; setae about same length as head setae. Elytral sides nearly parallel; intervals flat, striae fine, setae short. Spinules black, hind tibia with six teeth in distal comb and five teeth in anterior comb. Length 6.5 mm, width 3.0 mm.

Plant relationships. Two specimens were taken, one in a Larrea community, Area 5, in March, 1961, and the other in a Lycium community, Area 5, in February, 1961.

Comments. Ting points out that the salient characters of *C. leechi* are its extremely short setal vestiture whose length on the elytra is one-fourth to one-third the interval width; the slightly convex front between the eyes; and the nearly black tarsal bristles and corbel spinules.

Cryptolepidus nevadicus (Van Dyke)

Reference. Van Dyke, 1936:77.

Morphological characteristics. *Cryptolepidus nevadicus* is reddish-brown to black with gray and irridescent scales. Tarsal bristles and tibial spinules pale yellow in main, but light brown in some specimens. Rostrum broad, with transverse constriction at base; median sulcus narrow, extending from antennal articulation to posterior margin of basal transverse constriction. Pronotum smooth, as broad as long, sides convex; longer setae four times longer than head setae; no median sulcus. Elytral intervals flat; setae two and one-half times longer than interval width. Metepisternal suture visible at posterior end. Hind tibia with seven spinules in distal comb; anterior comb with five to seven spinules; however, number of spinules variable. Length 3.4 to 4.6 mm, width 2 mm.

Plant relationships. A total of 20 specimens was taken, mostly during 1961 and 1962 (Table 3).

Table 3. Collection records of *Cryptolepidus nevadicus* at the Nevada Test Site.

Area	Plant Host° or Community	Month and Number of Specimens
1	Grayia-Lycium	Jan. 1, Feb. 3, Mar. 8, April 2, May 2
5	Lycium	Feb. 1, Mar. 1
6	Atriplex-Kochia	Feb. 1, Mar. 2
17	°*Oenothera californica*	June 1
28	Mixed	Mar. 1
Cane Springs	Mixed	Mar. 3, April 2, Dec. 1

Cryptolepidus aridus, new species

Figs. 5, 6, 7

Morphological characteristics. Black. Antennal club reddish-brown, compact. Vibrissae absent. Scales on elytra imbricate, silvery with few brown to black intermixed in some specimens, with sheen which gives all specimens whitish color. Head and rostrum as long as prothorax; rostrum with median longitudinal groove free from scales; head one-third wider than rostrum at base, separated by well-defined basal constriction. Scrobes deep, terminating below eyes which are ovulate black and flattened; scape reaches posterior margin of eye; first joint of funiculus longer than second and third combined; club received in cupped seventh funicular segment. Prothorax wider than long, greatest width near apical region; postocular lobes and vibrissae absent. Dorsal surface covered with round, silvery white scales. Lateral surface with long setae. No median or lateral vittae. Elytra parallel, surface flat, striae fairly distinct, but punctation obscured by imbricate scales; setae

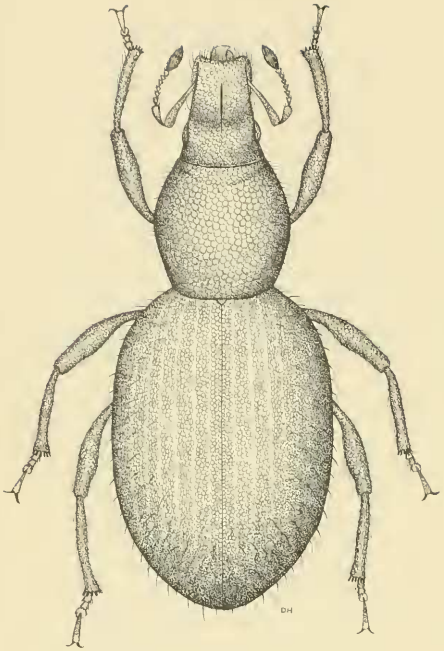

Fig. 5. *Cryptolepidus aridus,* dorsal view

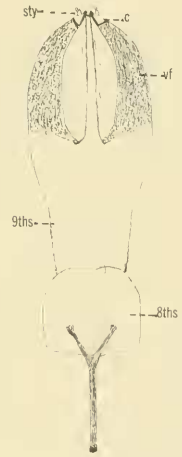

Fig. 6. *Cryptolepidus aridus,* female genitalia, ventral view. sty—stylus; c—coxite; vf—valvifer; 9ths—ninth sternite; 8ths—eighth sternite

similar in color and length to those on prothorax, but three times as long as ones on head and rostrum. Legs whitish, except for corbel spinules which are amber colored, and black ventral tarsal spines. Spinules of tibial comb widely spaced and short. Fourth segment of tarsus as long as other three combined. Claws widely separated and long. Aedeagus (Fig. 8) characteristic of *C. aridus,* but differs in a number of respects from that of other species of this genus. (See Ting, 1940).

Type locality. Nevada Test Site near Mercury, Nye County, Nevada. Collected by members of the Brigham Young University A.E.C. Project, 1960 to 1962. Holotype in the U.S. National Museum. Four paratypes in the entomological collection at Brigham Young University.

Plant relationships. Five specimens were taken as follows: two in a Grayia-Lycium community, Area 1, in May, 1960, and April, 1962; two in a Coleogyne community, Area 2, in January and March, 1961; and one in an Atriplex-Kochia community, Area 6, in February, 1961.

Comments. *Cryptolepidus aridus* is a small species. The corbels are open with widely spaced amber colored spinules. The small size and silvery-colored scales are distinctive.

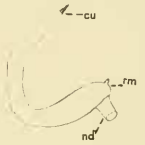

Fig. 7. *Cryptolepidus aridus,* spermatheca (receptaculum seminis). cu—cornu, distal portion of spermatheca; rm—ramus, portion of spermatheca receiving the seminal fluid; nd—nodulus, that part of the spermatheca attaching to the spermathecal gland

Cryptolepidus cazieri (Van Dyke)

References. Van Dyke, 1936b:73; Ting, 1940: 148.

Morphological characteristic. Oblong, robust, black, appendages rufous, densely clothed with imbricated, gray and light brown scales, latter forming median and lateral vittae on pronotum, and irregular patches on elytra. Rostrum with pronounced basal, transverse constriction; dorsum convex from base to nasal plate; narrow median sulcus; setae on rostrum and head same length; first funicular segment of antennae more elongate than in other species of genus; scrobes

nearer posterior end than in other species; nasal plate broadly and shallowly emarginate. Pronotum tuberculate, broader than long. Elytra one-fourth longer than broad, rounded at base and apex, flattened, setae arranged in two or three irregular rows per interval. Hind tibia with distal comb with 10 spinules; anterior comb with five spinules. Scales dense beneath; first and second ventral segments slightly concave. Length 5.1 mm, width 2.8 mm.

Plant relationship. One beetle was taken in a Lycium community, Area 5, in March, 1961.

Comments. *Cryptolepidus cazieri*, according to Ting (1940), may be easily distinguished from the other described species of this genus as follows: pronotum tuberculate; dorsum of rostrum convex from base to nasal plate; only species predominantly tan to brown.

Subfamily Leptopiinae
Tribe Ophryastini

Genus *Ophryastes* Schoenherr

References. Schoenherr, 1833:508; LeConte and Horn, 1876:30; Fall, 1907:260, 1910:189; Davis, 1947:483-551; Kissinger, 1964:31.

Morphological characteristics. The subfamily Leptopiinae, according to Kissinger, has elbowed antennae with compact club, rostrum grooved for their reception; rostrum not received into prosternum; rostrum never long and slender; tarsi usually dilated, third segment bilobed, brush-like beneath; mandibles with deciduous cusp, leaving scar; prothorax with anterior margin produced into prominent, rounded lobe adjacent to eye; eye partly covered by anterior margin of prothorax; mandible with four or more large setae.

The tribe *Ophryastini* is characterized by well-developed ocular lobes, eyes elongated, transverse, accuminate beneath, and in part covered; mentum large, covering maxillae; scrobes directed beneath; rostrum large, quadrangular; eyes narrow and acute below, partially concealed by ocular lobes.

If the species listed in the Leng Catalogue under the genera *Eupagoderes* and *Ophryastes* are now to be considered in the genus *Ophryastes*, the characteristics as presented by Kissinger (1964) should be followed: antennal funiculus and dorsal portion of tarsal segments 1 to 3 clothed with decumbent, usually broad scales; rostrum trisulcate—if sulci are obliterated then tarsal segments in basal half not dotted ventrally with coarse setae; antennal scrobe usually well defined, dorsal margin rather straight; hind coxae separated by distance not greater than width of coxa; suture between sterna 1 and 2 straight; elytra regularly 9 to 10 striate, not nodose in apical fourth; lateral rostral sulcus not abruptly turned laterally towards antennal scrobe; prothorax wider at base than apex; sternum 2 shorter than 3 and 4 combined; tarsal segment 3 pubescent beneath and broadly bilobed, at least in male; prothorax more or less tuberculate laterally; apex of tibia 3 with two rows of setae, corbel enclosed.

The two species of *Ophryastes* collected at the test site may be separated from other species as follows:

Rostrum with well-developed median sulcus; thorax finely and sparsely punctate, tibiae not denticulate within; lateral sulcus of rostrum short, linear; elytral striae fine, intervals flat, punctation fine; length 6 to 12 mm ..... *geminatus* Horn

Rostrum without median sulcus; thorax more coarsely and closely punctate; tibiae, at least anterior, denticulate within; lateral sulci of rostrum longer, arcuate, convergent basally; elytral striae closer together, deeper punctures; length 7 to 14 mm ..... *varius* (LeConte)

Ophryastes varius (LeConte)

Reference. LeConte, 1853:439-448.

Morphological characteristics. Dorsum of rostrum and front continuous, without interruption by transverse impression at base of rostrum; rostrum without median sulcus, convex and broadened at apical portion of rostrum. Lateral sulci of rostrum long, arcuate and convergent basally. Surface sparsely punctured, covered with white scales. Prothorax coarsely and closely punctate. Surface covered with silvery white scales, with median and lateral plumbeous stripe. Elytra broadest behind middle, finely striate with coarse punctures widely separated, surface covered with white scales interspersed with plumbeous ones which in some species form spots or vittae. Legs and body beneath clothed with white scales. Length 5.5 to 10.5 mm.

Plant relationships. A total of 63 beetles was taken. Most specimens were taken during 1960 and 1961, with others collected in other years from 1959 to 1965 (Table 4).

Table 4. Collection records of *Ophryastes varius* at the Nevada Test Site.

Area	Plant Host° or Community	Month and Number of Specimens
1	Grayia-Lycium	Mar. 2, April 7, May 6, June 3
4	Grayia-Lycium	Mar. 1, April 2, May 3, June 1, Nov. 1
5	°*Larrea divaricata*	May 1, June 1, July 10, Aug. 1
	Lycium	Mar. 1, April 1, May 3
6	Atriplex-Kochia	April 1, May 7, June 1
10	°*Larrea divaricata*	July 1
	Mixed	Aug. 2
12	°*Juniperus osteosperma*	June 1
	Pinyon-Juniper	July 1
16	°*Atriplex canescens*	Aug. 1
26	Larrea	July 1
28	Mixed	May 1, June 1
Cane Springs	Mixed	April 1

Ophryastes geminatus Horn

Reference. Horn, 1876:35.

Morphological characteristics. Rostrum with slight interruption by transverse impression at base of rostrum; median sulcus variable in impression; lateral sulci short and varying in depth; covered with white scales, except for small plumbeous spot in front of eyes and at base of scrobes. Prothorax wider than long, median line rather impressed, disc coarsely punctate, covered with white scales except for plumbeous stripes on each side. Elytra one-third longer than wide, striae fine with small punctures covered with plumbeous scales which gives vittate appearance in most specimens. Legs and body beneath covered with white scales intermixed with plumbeous ones. Length 6.5 to 12 mm.

Plant relationships. A total of seven specimens was taken. Two were from a Grayia-Lycium community, Area 10, in June, 1964; one on *Grayia* sp., Area 4, in June, 1960; one on *Atriplex canescens*, Area 26, in June, 1965; one on *Chrysothamnus* sp., Midvalley, in June, 1965; and two on *Larrea divaricata*, Area 5, in June and September, 1961.

Tribe Leptopiini

Genus *Orimodema* Horn

Reference. Horn, 1876:43.

Morphological characteristics. Genus *Orimodema* with seventh segment of flagellum distinct from club; third tarsal segment broader than second, tarsi densely pubescent beneath; scrobes deep, well defined, strongly arcuate, passing beneath at distance from eyes; first ventral suture arcuate; second sternite usually as long or longer than third plus fourth; vestiture squamose but not intermixed with setae or pubescence; anterior tibiae denticulate within; nasal plate depressed, but not sharply defined.

Orimodema protracta Horn

Reference. Horn, 1876:44.

Morphological characteristics. The species *O. protracta* is elongate, densely covered with brownish scales intermixed with grayish small ones; head and rostrum as long as thorax. Prothorax cylindrical, broadest near apex; elytra elongate, base not wider than prothorax; disc feebly convex; feebly striate, intervals flat, densely covered with brownish-gray scales. Under surface densely clothed with brown and gray scales. Tibiae sparsely fimbriate. Length 10 mm, width 3 mm.

Plant relationship. One specimen was taken in a Pinyon-Juniper community, Area 12, in August, 1962.

Genus *Paracimbocera* Van Dyke

References. Van Dyke, 1938:1; Ting, 1940: 136.

Morphological characteristics. Species of the Leptopiini tribe have tarsal segments on ventral surface with bristle-like setae only or with greatly reduced pubescent tufts at apices; last segment of funiculus closely applied to base of antennal club. The genera of this tribe are fairly common and found mainly in the western United States.

The genus *Paracimbocera* proposed by Van Dyke (1938) has been characterized by Ting (1940) as follows: small tufts of pubescence present at apices of tarsal segments. Third tarsal segment generally distinctly larger than second (both characters much more pronounced on male specimens); antennal scrobes shallow and greatly widened at posterior end. Postocu-

lar prothoracic lobes prominent; pubescent tarsal tufts in both sexes present only on third segment of all tarsi.

The two species of this genus known for the test site may be separated, by the aid of Ting's (1940) key, from other species as follows:

Elytral setae length on declivity four times width of intervals; three to four irregular rows of setae per interval on declivity; tarsal bristles and corbel spinules dark brown, nearly black; metaepisternal suture distinct . *atra* Van Dyke

Elytral setae length on declivity two times width of intervals; two or three irregular rows of setae per interval on declivity; tarsal bristles and corbel spinules reddish brown; metaepisternal suture obscure ..... *artemisiae* Ting

Paracimbocera atra Van Dkye

Reference. Van Dyke, 1938:2.

Morphological characteristics. Black and elongate; head, prothorax and elytra densely clothed with black scales, those of head and prothorax granular white; scales of elytra flat and closely set; elytra with long pile, denser on declivity, whitish to fulvous, underside of body with mixture of whitish and plumbeous scales and setae. Length 5 to 7.5 mm.

Plant relationships. Eight specimens were taken from 1961 through 1965 as follows: four in a Grayia-Lycium community, Area 10, in June; one from *Ephedra nevadensis*, Area 6, in June; and three in a Pinyon-Juniper community, Area 12, in July and August.

Paracimbocera artemisiae Ting

Reference. Ting, 1940:139.

Morphological characteristics. Body color gray and black mottled; with black irregular vitta along second elytral interval. Tarsal bristles and tibial spinules reddish brown. Rostrum transversely constricted at base. Prothorax wider than long; surface with scales raised, giving slight tuberculate appearance; setae shorter than elytral setae. Elytral striae fine; intervals flat, setae about length of interval widths; setae on declivity twice length of intervals width. Length 5 to 7 mm.

Plant relationships. Nine beetles were taken from 1960 to 1962 as follows: two in a Larrea community, Area 5, in January and February; one in a Lycium community, Area 5, in March; two in a Coleogyne community, Area 10, in February and May; one in a Grayia-Lycium community, Area 10, in May; one in a Pinyon-Juniper community, Area 12, in August; one in an Artemisia community, Area 14, in March; and one in a mixed community, Cane Springs, in March.

Genus *Miloderes* Casey

Reference. Casey, 1888:252.

Morphological characteristics. The genus *Miloderes* now placed in the tribe Leptopiini has small tufts of pubescence present at the apices of tarsal segments. In male specimens third tarsal segment generally distinctly larger than second. Antennal scrobes deep and only slightly widened at posterior end. Postocular prothoracic lobes absent or only slightly evident. Pubescent tufts present in males at apices of basal three tarsal segments on fore legs. Rostral length slightly less than distance between eyes. Antennal funicular segments one to six not cupped at apices. Postocular lobes slightly evident.

KEY TO SPECIES OF MILODERES

(After Ting, 1940:151)

Color brown and silvery gray. Fore tibiae with outer apical portion evenly rounded. Scales of pronotum and elytra with central punctures .. *setosus* Casey

Color brown to sienna with white scales in irregular pattern on head and elytra, scales without central punctures. Prothoracic tibae rounded apically; 12 to 13 spinules on middle tibia; black vestiture, sparse setae ..... *mercuryensis*, new species

Color uniform green. Fore tibae with outer apical portion elongated. Scales of pronotum and elytra without central punctures ..... *viridis* Pierce

Miloderes mercuryensis, new species
Figs. 8, 9

Morphological characteristics. *Miloderes mercuryensis*, one of the three species ascribed to this genus, may be separated from the other two as follows: size 4 to 4.3 mm; brown to sienna with white scales in irregular pattern on head and elytra. Reddish-brown scales on margins of prothorax, on legs, especially tarsi and antennae. Rostrum wider than long with transverse impression just slightly posterior to antennal articulation, with median fovea on transverse impression. Pronotum broader than long, greatest width near apex; postocular lobes present, rounded opposite eye, with long, golden colored vibrissae which reach eye; setae on head and between closely arranged round punctures. Elytra with closely placed, deep strial punctures; setae length three to four times width of intervals. White scales irregularly arranged, thus making mottled white and brownish pattern; sides parallel with rounded humeral angle. Prothoracic tibiae rounded apically; third segment of tarsus broad, deeply emarginate; under-surface covered with white setae. Middle tibiae with 12 to 13 spinules. Posterior tibia with nine spinules, corbels open.

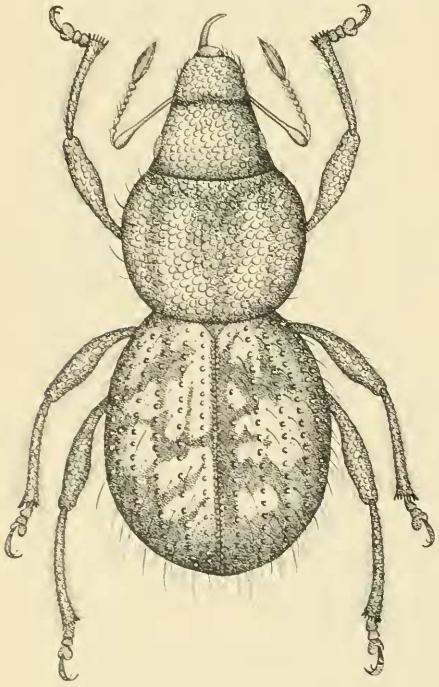

Fig. 8. *Miloderes mercuryensis*, dorsal view

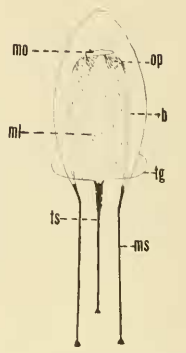

Fig. 9. *Miloderes mercuryensis*, aedeagus, ventral view. mo—median orifice; op—orificial plate; b—baculum; ml—median lobe; tg—tegmen; ts—tegminal strut; ms—median strut

The small size, color, scales without central punctures, short rostrum, 12 to 13 spinules on middle tibia, black vestiture, sparse setae, and shorter length than *M. sctosus* and *M. viridus* characterizes *M. mercuryensis*. The male genitalia (Fig. 9) is distinctive.

Type locality. Nevada Test Site, near Mercury, Nye County, Nevada. Collected by members of the Brigham Young University A.E.C. Project, 1961 to 1965. Holotype male in the U.S. National Museum. Two paratypes in the entomological collection at Brigham Young University.

Plant relationships. One specimen was taken from *Sphaeralcea ambigua*, Area 5, in June, 1964; one from *Grayia spinosa*, Area 26, in June, 1965; and one from a pit-can trap on the Jackass Flats approach road in a mixed plant association within the Larrea-Franseria community.

Comments. Figure 8 shows the cusp in place on the tip of the mandible of one of the specimens. This is a most interesting species.

Genus *Dirotognathus* Horn

Reference. Horn, 1876:79.

Morphological characteristics. This monotypic genus has ocular lobes, eyes elongate, transverse, acuminate beneath, and at least in part covered; mentum small, not retracted;

maxillae free; scrobes feebly angled, rapidly evanescent.

Dirotognathus sordidus Horn

Reference. Horn, 1876:80.

Morphological characteristics. *Dirotognathus sordidus* is oval, robust in form; covered with dark cinerous scales with short, decumbent, dark brown setae. Head and rostrum as long as thorax which is oval, broader than long. Elytra broadly oval, broader at base than thorax, finely striate; intervals flat. Body beneath and legs less densely scaly and very sparsely hairy. Length 5.2 mm, width 3 mm.

Plant relationship. Six specimens were collected in a Pinyon-Juniper community, Area 12, during June, July, and August, 1961.

Subfamily Cleoninae

Tribe Cleonini

Genus *Cleonus* Schoenherr

Reference. Schoenherr, 1826:145.

Morphological characteristics. The genus *Cleonus* may be characterized as follows: beak not dilated at tip; gular peduncle shorter than in *Lixus;* front and middle tarsi broad, third segment at least spongy and bilobed; hind tarsi hairy beneath first division, but broad and spongy in second; pubescence in longitudinal stripes, no transverse or oblique bands. Body elongate.

Blatchley and Leng (1916:329) observed that it is difficult to set forth in a key any definite characters which sharply define the two genera, *Cleonus* and *Lixus.*

Cleonus denticollis Casey

Reference. Casey, 1891:180.

Morphological characteristics. *Cleonus denticollis* is narrow to slightly robust, somewhat depressed above, elongate-suboval; black, densely clothed with short, recumbent, squamiform pubescence, cinereous to ferruginous in color; some sparse, short erect hairs; head sparsely punctate; beak shorter than prothorax, broadly bisulcate, densely pubescent above, median carina narrow but not acute, moderately elevated. Prothorax one-fourth wider than long, widest at anterior lateral tubercles which are very pronounced; sides behind them parallel to base, latter broadly cusped in middle, wider than apex; disc coursely foveolate, sides covered with white pubescence; middle sparsely clad. Scutellum inconspicuous. Elytra two-thirds longer than wide; humeri not prominent; disc with elevated alternate intervals; pubescence denuded on spots at basal portion of each elytron and along suture near apex in some specimens. Abdomen densely pubescent. Legs moderately stout, femora feebly annulate at apical third. Length 10.0 to 10.2 mm., width 4.0 to 4.2 mm.

Plant relationships. A total of 152 specimens was taken, mostly in 1960 and 1961 (Table 5).

Table 5. Collection records of *Cleonus denticollis* at the Nevada Test Site.

Area	Plant Host° or Community	Month and Number of Specimens
1	Grayia-Lycium	Jan. 1, Mar. 48, April 15, May 3, June 5, July 22, Aug. 5, Sept. 3, Oct. 2
	Salsola	Mar. 1, July 6, Aug. 2, Sept. 1, Nov. 2
4	Grayia-Lycium	April 1, Oct. 1
5	Larrea	June 8, July 4, Aug. 8, Oct. 1
6	Atriplex-Kochia	June 1
10	Coleogyne	July 1
	°*Hymenoclea fasciculata*	July 7
	°*Larrea divaricata*	July 1
28	Mixed	Feb. 1, July 1, Aug. 1

Cleonus lobigerinus Casey

Reference. Casey, 1891:191.

Morphological characteristics. Casey characterized *C. lobigerinus* in this manner: body slender and convex, integument feebly shining, pubescence cinereous, a broad discordal anteriorly constricted spot denuded along middle, marginal vitta on pronotum, also denuded on second, sixth and eighth elytral intervals. Head transversely impressed between eyes, rostrum rather long, feebly carinate, subequal in length to prothorax. Prothorax nearly as long as wide, apex broadly bisinuate, narrower than base, latter angularly lobed in middle, sides convergent from base to apex; disc coarsely punctate, deeply impressed in basal third, slight evidence of being carinate anteriorly. Elytra more than two times as long as wide; sides parallel and nearly straight, disc with deep approximate punctures. Abdomen and legs densely pubescent with few sub-denuded punctures. Length 8.9 mm, width 4 mm.

Plant relationships. Three specimens were taken as follows: one in a Grayia-Lycium com-

munity, Area 10, in June, 1964; one in a Salsola community, Area 7, in July, 1962; and one from *Atriplex canescens*, Area 16, in August, 1964.

Subfamily Erirhininae
Tribe Smicronychini

Genus *Smicronyx* Schoenherr

Reference. Schoenherr, 1843:313.

Morphological characteristics. The genus *Smicronyx* has tibia 3 unarmed or with spine less than one-half as long as tarsal claw; body lacking waterproof covering. Prosternum with coxae situated much closer to hind margin than to front margin; rostrum distinctly longer than head (in lateral view); scape not reaching anterior margin of eye; tarsal claws connate at base; femora unarmed; prothorax with postocular lobes; tarsal segment 4 shorter than segments 1 to 3 combined.

Smicronyx imbricatus (Casey)

References. Casey, 1892:391-392; Anderson, 1962:203-305.

Morphological characteristics. Rostra of both sexes black to piceous, slender and curved; squamose, punctate from base to near apex in male and female. Head black, squamose; antennae piceous, with pale brown scales. Prothorax black, sides subparallel; evenly covered with deep rounded punctures; scales ovate, white at sides and along midline, medium to light yellowish-brown elsewhere; prosternum deeply emarginate, not concave. Elytra black, intervals covered with imbricate elliptical scales, mostly white in humeral regions, light or medium brown with scattering of white posterior to humeral regions. Underside of thorax and abdomen black covered with ovate, white scales having violet to bluish irridescence. Femora reddish, covered with elongate and ovate, pale brown to white scales. Tibiae black. Third segment of tarsi broader than first two; fourth segment extending beyond third; claws connate near base. Length 2 to 2.4 mm, width 0.70 to 1.00 mm.

Plant relationships. A total of 54 specimens was taken, mostly during 1962, 1964 and 1965 (Table 6).

Table 6. Collection records of *Smicronyx imbricatus* at the Nevada Test Site.

Area	Plant Host° or Community	Month and Number of Specimens
5	°*Lycium pallidum*	July 1
	Larrea	July 1
12	°*Juniperus osteosperma*	June 4, July 5
	°*Pinus monophylla*	June 8, July 5, Aug. 7
	°*Chrysothamnus viscidiflorus*	Aug. 1
	°*Chrysothamnus nauseosus*	Aug. 1
	°*Ribes* sp.	Aug. 2
16	°*Artemisia tridentata*	July 1
	°*Argemone corymbosa*	June 1
	°*Eurotia lanata*	June 1
	°*Mentzelia albicaulis*	June 1
	°*Sallugia paradoxa*	June 2
	°*Pinus monophylla*	June 2
17	Unknown	Aug. 1
18	°*Grayia spinosa*	June 1
	°*Pinus monophylla*	June 2
	°*Juniperus osteosperma*	June 3
	°*Gutierrezia microcephala*	Aug. 1
23	Mixed	July 1
26	°*Atriplex canescens*	June 2
	°*Pinus monophylla*	June 1

Smicronyx sp.

Specimens of *Smicronyx* not referred to a species were taken at the test site. They are very similar to *S. cognatus* Dietz, now considered as a synonym of *mucidus* Dietz.

Plant relationships. Three specimens were collected in July, 1962, as follows: one from *Artemisia tridentata*, Area 14; one in a Larrea community, Area 5; and one in a mixed community, Area 23.

Genus *Promecotarsus* Casey

Reference. Casey, 1892:408.

Morphological characteristics. Body cylindrical, convex, longer and with more glabrous tarsi having small third segment, fourth segment very long and subequal in length to entire remainder. Vestiture dense over entire body, consisting of small imbricated scales, with recurved, subrecumbent setae on each strial interval. Rostrum constricted at base, head spherical, eyes oblong. Prothorax constricted at apex, ocular lobes more or less distinct. Scutellum small. Abdomen flat, second segment as long as the next two and not quite as long as fifth.

The test site species may be separated from others as follows:

1. Tarsal claws subparallel; prothorax much wider than long, with ocular lobes prominent ..... *fumatus* Casey

   Tarsal claws widely divergent; prothorax very nearly as long as wide; ocular lobes not prominent 2

2. Prothorax abruptly, deeply constricted near the apex, latter but slightly narrower than base ..... *maritimus* Casey

   Prothorax gradually more strongly narrowed and broadly, feebly constricted toward apex, latter scarcely more than two-thirds as wide as base .. *densus* Casey

Promecotarsus densus Casey

Reference. Casey, 1892:410.

Morphological characteristics. *Promecotarsus densus* is robust, subcylindrical, convex, black, densely clothed with oval, whitish overlapping scales, with distinct recurved setae. Head glabrous, constriction deep; beak slender, polished, rugosely punctate near base, almost three-fifths as long as elytra; antennae inserted beyond basal third, second funicular segment about as long as next two; club compact and shining toward base. Prothorax wider than long, sides parallel, convergent and constricted at apex; disc convex and very densely punctate throughout. Elytra at base about one-fourth wider than prothorax, one-half longer than wide; striae indicated by fine but sharply defined partings of dense crust of scales. Legs stout, tarsi long, divergent, connate at base. Length 2.4 mm, width 1.1 mm.

Plant relationships. Three specimens were collected in 1964 and 1965 as follows: two from *Artemisia tridentata* in August, and one from *Juniperus osteosperma* in July, all in Area 12.

Subfamily Apioninae

Genus *Apion* Herbst

Reference. Herbst, 97:100.

Morphological characteristics. Weevils of the subfamily Apioninae are characterized by having straight antennae, scrobes wanting; segments of antennae club compactly united; pygidium concealed; trochanters large, femora attached to apex; form pear-shaped. Small, not over 4.5 mm.

Two genera constitute this subfamily in the United States. The genus *Apion* may be distinguished from *Podapion* as follows: front femora not stouter than others; antennal club large, last segment larger than preceding.

Apion varicorne Smith

Reference. Smith, 1884:60.

Morphological characteristics. The only species of the genus *Apion* collected on the project at the test site is *varicorne*. It is black in color, covered with dense white pubescence. Antennae black except basal segment which is yellow; rostrum of female longer than that of male; intervals of elytra flat. Length 1 to 1.3 mm.

Fall (1898:160) discussed several varieties of this species. Kissinger (1964:32) placed *varicorne* in a group with three other species which occur throughout the western and southern United States, Mexico and Guatemala.

Plant relationships. Fourteen specimens were collected. Four were taken from *Dalea polyadenia* near Buckboard Mesa in July, 1965; five from *D. polyadenia* in Jackass Flats in August, 1965; four from *D. polyadenia* and one from *Eriogonum nodosum* near Tippipah Spring in August, 1965.

Subfamily Rhynchitinae

Auletobius humeralis Boheman

Reference. Boheman 1859:117.

Morphological characteristics. Three-fourths longer than wide; black, with elytra reddish-brown, except for narrow black line along suture; punctation fine; pubescence sparse, short, semierect, whitish. Head with occiput wider than long, feebly convex between eyes; punctation between eyes shallow, polished, eyes large and prominent. Rostrum as long as thorax and occiput, slightly arcuate behind base of antennae; antennae inserted within basal third of beak, two basal segments stout, others small; club large, very loosely jointed. Prothorax widest at basal third, one-third wider than long; base broadly and feebly arcuate; disc feebly convex, scutellum large. Elytra broadly and separately rounded at apex, one-half longer than wide, two-

thirds wider than prothorax; disc convex, impressed along suture; claws armed with tooth. Length 2.1 mm.

Plant relationship. Two specimens were collected in June, 1965, on *Ephedra nevadensis* in the environs of Cane Springs.

Auletobius sp.

Represented by three specimens. Color of head and body bluish black with sheen; rostrum and legs rufus. Size 2 mm.

I am unable to determine this species. It does not agree with any described species. I have before me specimens of all the species listed in Leng's catalogues except *mariposae* Zimmerman and those described by Voss.

One specimen was taken from *Ephedra nevadensis* near Cane Springs in June, 1965, and two specimens from *Chrysothamnus viscidiflorus* on Rainier Mesa in August, 1965.

Subfamily Myrmecinae

Genus *Myrmex* Sturm

Reference. Sturm, 1826:172.

Morphological characteristics. Members of the subfamily Myrmecinae to which the genus *Myrmex* belongs have tibiae that are not fossorial; rostrum free, not received by prosternum; humeri not truncated by protruding mesopleura; lateral angles of first sternite covered by elytra; beak usually at least as long as prothorax; gular peduncle usually long; sternites nearly equal, or first longer; claws usually more or less dentate; prothorax pedunculate; form ant-like.

Four genera in this tribe may be separated by the following key (Kissinger, 1964:50-51):

KEY TO THE GENERA OF MYRMECINAE

1. Front coxae inserted near middle of prosternum, coxae more or less equidistant from anterior and posterior margins of prosternum; inner margin of mandible toothed 2

   Front coxae much closer to hind margin of prosternum than to front margin, distance to front margins more than three times as great as distance to hind margin; mandible slender, triangular in outline, inner margin with minute basal tooth; rostrum slender, very long; femora clavate, with large triangular tooth ..... *Erodiscus* Schoenherr

2. Elytra elongate oval, humeri well developed 3

   Elytra ovate, rounded, humeri absent ..... *Oopterinus* Casey

3. Femora toothed; male lacking dorsal excavation on rostrum; length more than 3.0 mm ..... *Myrmex* Sturm

   Femora not toothed; male with dorsal excavation on rostum; length less than 3.0 mm ..... *Micromyrmex* Sleeper

Myrmex lineata lineata (Pascoe)

Reference. Pascoe, 1872:454.

Morphological characteristics. *Myrmex l. lineata* is a fairly common species in the southern portions of the Great Basin. The single specimen contained in the collections made at the test site is elongate, subcylindrical, color black with dense gray pubescence. Rostrum three-fourths as long as pronotum, with median, impunctate polished area. Antennae black, scape reaching eye, first segment of funicle longer than second; club elongate, oval, feebly pubescent Head clothed with white pubescence, sparsely intermixed with dark brown setae; punctate. Eyes with many facets, round. Pronotum slightly arcuate at middle, with pronounced median carina; densely punctate; from each puncture issues many branched setae (palmate); scutellum prominent, densely covered with very fine, white setae. Elytra with glabrous prominent intervals; dense pubescence on intervening intervals, surface slightly punctate, sides practically parallel. Legs and venter densely clothed with white setae; each femora with small acute tooth; claws toothed. Length 12.3 mm, width 3 mm.

Plant relationship. One specimen was collected in a Larrea community, Area 5, in October, 1961.

Subfamily Magdalinae
Tribe Magdalini

References. Germar, 1817:340; Horn, 1873: 407-469; Fall, 1913:27.

Morphological characteristics. Species of this tribe and genus have anterior coxae contiguous; elytra unicolorous, usually black, glabrous and widened posteriorly; claws simple or toothed.

Magdalis lecontei tenebrosa Fall
Fig. 10

Reference. Fall, 1913:28.

Morphological characteristics. *Magdalis lecontei tenebrosa* Fall is black throughout; femora toothed, not impressed at base; hind angles of thorax more or less produced and divergent. Antennal club normal, second funicular segment twice as long as wide, and as long as two following. Length 2.5 to 5 mm, width 2 to 3 mm.

Fig. 10. *Magdalis lecontei tenebrosa*

Plant relationships. Eleven specimens were collected in 1964 and 1965 as follows: nine in June and one in July from *Pinus monophylla*, Area 12; one from a Pinyon-Juniper community, Area 12, in July.

Subfamily Anthonominae

This is a large subfamily according to Kissinger (1964), consisting of two tribes, *Endaeini* with eleven genera and *Anthonomini* with fourteen.

The following characters will aid in placing species in this subfamily collected at the Nevada Test Site: trochanter short and triangular, femur attached to side of trochanter, base of femur closely adjacent to coxa; antennae distinctly elbowed, funiculus consisting of five to eight segments; scape fitting into scrobe; usually inserted toward apex of rostrum; club elongate, oval, entirely pubescent, distinctly annulate; rostrum not received into prosternal emargination, slender, usually longer than prothorax, mandibles small, lacking deciduous cusp; tarsus with four distinct segments, segment 3 usually strongly bilobed; mesepimeron not ascending and not visible in dorsal view; front coxae contiguous; claws free at base and with basal tooth; hind tibiae mucronate at tip; mesepimeron not ascending and not visible in dorsal view; suture between sterna 2 and 3 deep and straight.

Tribe Anthonomini

The characteristics for the tribe Anthonomini are, in the main, the same as for the subfamily Anthonominae. Thus, if a specimen agrees with the above assemblage of characters, it may well be considered as belonging to the tribe Anthonomini.

The species from the test site which belong to this tribe represent four genera which may be separated by the following key:

1. Claws toothed 2

   Claws simple. Hind tibiae mucronate; prosternum short in front of coxae. Form convex; tibial armature very evident 3

2. Posterior tibiae unguiculate; pygidium covered; claws armed with a long tooth; beak rather short and stout; eyes placed latero-inferiorly, somewhat approximate beneath ..... *Macrorhoptus* LeConte

   Posterior tibiae mucronate; scrobes long, directed against the eye; funicle of antennae 6 or 7 jointed; claws elongate, ovoidal ..... *Anthonomus* Germar

3. Scrobes directed against the eye ..... *Epimechus* Dietz

Scrobes broad and deep for about one-half the distance toward the eyes, then gradually evanescent ..... *Brachyogmus* Linell

Genus *Macrorhoptus* LeConte

Reference. LeConte, 1876:208.

Morphological characteristics. Specimens of the genus *Macrorhoptus* have the following characteristics: claws toothed; middle coxae separated; posterior tibiae unguiculate; pygidium covered; rostrum rather short and stout; eyes latero-inferior, somewhat approximate beneath.

With the aid of the key prepared by Sleeper (1957:71) the species of this genus may be separated.

KEY TO THE KNOWN SPECIES OF *Macrorhoptus*

1. Scaly vestiture on elytra without intermixed erect or semierect clavate bristles 2

   Scaly vestiture on elytra with intermixed erect or semierect clavate bristles 3

2. Scales on rostrum more or less prostrate, broadly oval, those on "ocular lobes" broadly oval; Texas and California ..... *estriatus* LeConte

   Scales on rostrum erect, elongate and narrowly clavate, those of "ocular lobes" elongate, narrowly clavate; British Columbia ..... *sidalceae* Sleeper

3. Prostrate scales on disc of elytra longitudinally striate, for the most part 4

   Prostrate scales of disc of elytra not striate at all; smaller and paler species; Texas ..... *sphaeralciae* Pierce

4. Scales of elytra prostrate, having a smoothly, evenly placed appearance; rostrum of female short and stout; Arizona ..... *hispidus* Dietz

   Scales of elytra very grizzled, being roughened in appearance; rostrum of female elongate and cylindrical; California ..... *griseus* Sleeper

Macrorhoptus hispidus Dietz

Reference. Dietz, 1891:185.

Morphological characteristics. *Macrorhoptus hispidus* has pale gray or brownish scales which are longer and broader than in *estriatus*. Prothorax densely and finely punctured, with broad stripe of pale brown scales along middle; sides paler. Legs moderately long; femora slightly clavate, anterior armed with triangular tooth, middle and posterior mutic. Tarsi moderately stout, posterior more slender, third segment bilobed. Claws armed with tooth. Length 2.4 to 3.3 mm.

Plant relationships. Ten specimens were collected during 1965 as follows: one from *Sphaeralcea* sp., Cane Springs, in June; two from *Sphaeralcea* sp., Area 17, in June; three from *Sphaeralcea* sp., Area 26, in June; one from *Grayia spinosa*, Area 18, in July; and three from *Artemisia* sp., Area 18, in July.

Comments. It is difficult to separate *M. hispidus* and *M. sphaeralciae*. The specimens before me representing the three species as above probably would be considered as two valid species with *sphaeralciae* as a subspecies of *hispidus*.

Genus *Anthonomus* Germar

Reference. Germar, 1821:320.

Morphological characteristics. Rostrum usually long and slender; scrobes long, directed against the eyes; antennal scape reaching the eye or nearly so; funicle 6 or 7 jointed; club elongate-ovate; elytra distinctly striate and punctured; pygidium in the male more or less exposed, femora usually toothed; front and middle tibiae with a hook, hind ones with a spine at tip; claws toothed.

KEY TO THE SUBGENERA OF *Anthonomus* AT THE NEVADA TEST SITE
(After Dietz, 1891:189)

1. Posterior tibiae alike in both sexes 2

   Posterior tibiae of male curved ..... *Cnemocyllus*

2. Eyes small, subrostral ..... *Anthonomorphus*

   Eyes at least moderately large, position normal. Vestiture of derm not intermixed with erect setae. Prosternum not emarginate in front, last segment of funicle distinct from the club. Club elliptic or ovoidal, not very loosly articulate ..... *Anthonomus*

Dietz divided the subgenus *Anthonomus* into nine groups. *Anthonomus bolteri confusus* belongs in the Suturalis group, *A. histus* the Squamosus group, and the species described by Fall and *ornatulus* of Dietz in the subgenus *Cnemocyllus*.

Subgenus *Anthonomorphus*

Anthonomus peninsularis Dietz

Reference. Dietz, 1891:195.

Morphological characteristics. Oblong oval, color variable, black to reddish brown; clothed with white pubescence above and beneath; rostrum slender, with striae well developed; antennae inserted about two-fifths from apex; second segment of funicle longer than third. Eyes round. Head constricted behind eyes; coarsely punctate, sparsely subescent; frontal fovea deep. Prothorax much wider than long, twice as wide at base as at apex; surface coarsely punctate, each puncture bearing decumbent white seta; more closely placed at base and median line. Elytra wider at base than prothorax, striae prominent with deep punctures; interspaces slightly convex and lightly punctate; surface white pubescence. Legs slender; femora bidentate; tarsi with bifid claws, tooth long. Length 5 to 5.5 mm, width 2.6 to 3 mm.

Plant relationships. Seven specimens were collected in 1962 and 1965 (Table 7).

Table 7. Collection records of *Anthonomus peninsularis* at the Nevada Test Site.

Area	Plant Host° or Community	Month and Number of Specimens
4	Mixed	April 1
17	°*Sphaeralcea* sp.	June 2
18	°*Sphaeralcea* sp.	June 1
26	°*Sphaeralcea* sp.	June 1
	°*Ephedra nevadensis*	June 1
28	°*Sphaeralcea grossulariaefolia*	May 1

Subgenus *Anthonomus*
Group Suturalis

Anthonomus haematopus confusus Dietz

Reference. Dietz, 1891:209.

Morphological characteristics. *Anthonomus confusus* is now considered to be a subspecies of *A. haematopus* Boheman. It is similar in form to *A. bolteri* Dietz, the tribe of which was described from specimens from New Mexico. It is little smaller, rufo-testaceous, with coarse conspicuous white pubescence. Rostrum stout and slightly curved; coarsely punctured. Antennae stout, second segment of funicle longer than third. Club elongate and blackish in color. Eyes slightly convex. Head with coarse punctures and frontal fovea. Prothorax constricted at apex, punctate, with coarse pubescence; elytra with deep strial punctures; pubescence short and sparse. Length 2.5 mm, width 1.5 mm.

Plant relationships. Six specimens were taken from *Juniperus* sp., and one from *Artemisia tridentata*, all in Area 16 in July, 1962.

Subgenus *Anthonomus*
Group Squamosus

Anthonomus hirtus LeConte

References. LeConte, 1876:203; Dietz, 1891: 233.

Morphological characteristics. Similar in form and sculpture to *A. murinus* Dietz; densely covered with grayish and ochreous scales; body, antennae, and legs rufoferruginous. Rostrum slender and scarcely striate or punctured; second segment of funicle practically same length as third one. Three thoracic vittae, and along suture paler, legs rufopiceous, femora not strongly clavate, anterior armed with small tooth, middle and posterior mutic; tarsi rufus. Length 3 to 3.2 mm, width 1.3 mm.

Plant relationships. Three specimens were taken in June and August, 1965, as follows: one from *Sphaeralcea* sp., Area 12; one from *Eriogonum umbellatum*, Area 16; and one from *Artemisia tridentata*, Area 19.

Subgenus *Cnemocyllus*

Anthonomus ornatulus Dietz

Reference. Dietz, 1891:241.

Morphological characteristics. Elongate subovate, piceous, antennae and legs reddish, densely clothed with broadly oval scales, white and brown on upper surface and white beneath. Rostrum long, punctured with distinct median carina. Antennae slender, club dark. Eyes more convex. Head short, punctures deep, fovea obsolete. Prothorax wider than long. Punctures deep, surface covered with scales. Elytra oval, punctures concealed by white and some brownish scales, interspaces slightly convex; legs slender, clothed with white scales; anterior femur with scarcely perceptible tooth; tarsi slender and as long as tibiae; first segment longer than second in male, or equal to it in female; last segment long, distal end and claws blackish, latter armed with short obtuse tooth. Length 2.9 mm, width 1.1 mm.

Plant relationship. One specimen was taken from *Eurotia lanata*, Area 16, in June, 1965.

Subgenus *Cnemocyllus*

Anthonomus sphaeralciae Fall

Reference. Fall, 1913:55.

Morphological characteristics. Elongate oblong, piceous; rostrum, antennae and legs rufus; vestiture dense both above and below, consisting of pale ochreo-cinereous scales which are about twice as long as wide, almost uniform in color above except along median line and at sides of prothorax where they are whitish. Scutellum densely white. Body beneath covered with whitish scales; antennal funicle seven-segmented, second joint nearly twice as long as wide. Prothorax nearly as long as wide, subconical, apical constriction feeble. Front femora with small pointed tooth, middle and hind femora mutic. Length 3.2 to 3.4 mm, width 2 mm.

Plant relationships. Seventeen specimens were collected in 1965 (Table 8).

Table 8. Collection records of *Anthonomus sphaeralciae* at the Nevada Test Site.

Area	Plant Host° or Community	Month and Number of Specimens
12	°*Sallugia paradoxa*	June 1
	°*Chrysothamnus viscidiflorus*	Aug. 1
	°*Sphaeralcea* sp.	Aug. 3
	°*Elymus cinereus*	Aug. 1
	°*Atriplex canescens*	Aug. 1
16	°*Sphaeralcea* sp.	Aug. 3
17	°*Tetradymia glabrata*	July 2
18	°*Oenothera californica*	June 1
	°*Artemisia* sp.	July 1
19	°*Artemisia tridentata*	June 1
23	Mixed	Aug. 1
28	°*Sphaeralcea* sp.	June 1

Subgenus *Cnemocyllus*

Anthonomus cycliferus Fall

Reference. Fall, 1913:56.

Morphological characteristics. Form oval, piceous, legs and antennae rufus, club fuscous; clothed with overlapping oval or nearly circular white scales, intermixed with scattered darker scales varying from pale brown to blackish purple in color; these darker scales aggregated most noticeably in two imperfect discal pronotal vittae and in elongate discal elytra spot at about postepinotal vittae and in elongate discal elytral spot at about posterior third, and less evidently in sub-basal spot on either side of suture. Rostrum one-fourth longer than prothorax, finely punctate, polished; origin of antennae at point two-fifths from apex in male, just beyond middle in female; prothorax three-fourths as long as wide, sides arcuate and subparallel in basal half; surface completely concealed by vestiture. Elytra at base little wider than thorax, widest about middle, striae invisible. Front femora with small tooth; middle and hind femora not visibly toothed. Ungual teeth short and not approximate at tip. Length 2.7 to 2.8 mm, width 1.1 mm.

Plant relationships. Four specimens were taken in June and August, 1965, as follows: one from *Chrysothamnus teretifolius*, Area 6; two from *Artemisia tridentata*, Areas 12 and 17; and one from *Chaenactis stevioides*, Cane Springs.

Subgenus *Cnemocyllus*

Anthonomus tennis Fall

Reference. Fall, 1913:57.

Morphological characteristics. Narrowly oval, piceous, scape and tarsi fusco-testaceous, club

fuscous; vestiture white throughout, scales circular, not dense or overlapping. Prothorax about three-fourths as long as wide; sides arcuate; elytra at base wider than prothorax; striae visible; femora without tooth. Tarsal claws with long teeth, approximate at tip. This species is closely related to *A. cyclifcrus*, but is much smaller. Length 1.3 to 1.4 mm, width 0.9 to 1.0 mm.

Plant relationships. Nine specimens were taken from 1960 to 1964 (Table 9).

Table 9. Collection records of *Anthonomus tenuis* at the Nevada Test Site.

Area	Plant Host° or Community	Month and Number of Specimens
6	Grayia-Lycium	Aug. 1
12	°*Chrysothamnus paniculatus*	Aug. 2
16	°*Artemisia tridentata*	July 3
	°*Juniperus* sp.	July 1
26	Larrea	July 1
Cane Springs	Mixed	July 1

Epimechus gracilis Fall

Reference. Fall, 1913:59.

Morphological characteristics. Form narrow and elongate, black; antennae, except club, legs and sometimes rostrum rufous; vestiture consisting of large, round, white overlapping scales. Rostrum longer than other specimens of this species before me, squamose at base, finely punctate. Antennae inserted near middle of rostrum; funicle six-segmented; first and second combined, as long as other four segments; prothorax wider than long, widest at about middle, apical constriction broad, surface coarsely punctate. Elytra twice as long as wide, and three times as long as prothorax; striae strongly punctured. Femora mutic; claws simple. Length 1.6 to 1.9 mm, width 0.70 to 0.80 mm.

Plant relationship. Four specimens were taken from *Chrsothamnus viscidiflorus*, Areas 12 and 17, in August, 1965.

Genus *Brachyogmus* Linell

Reference. Linell, 1897:51.

Morphological characteristics. Type of the genus *Brachyogmus* is a small species; length 2.9 to 3.1 mm, width 1.3 mm; form convex; prothorax narrow; rostrum longer than head and prothorax; antennal scrobes straight, directed against the eyes, but abbreviated long before reaching them; hind tibiae mucronate; prosternum short in front of the coxae; claws simple, divergent.

This genus is closely related to *Epimechus* from which it differs in the narrow prothorax and the gradually evanescent scrobes.

Brachyogmus ornatus Linell

Reference. Linell, 1897:51.

Morphological characteristics. Form subovate, piceous, body color concealed by rounded scales, variegated with white, black and ferruginous, broad blackish variable band across elytra at about the middle. Rostrum longer than head and prothorax, at base scaly with white and ferruginous, outwardly shining piceous. Scrobes commencing two-fifths from apex, deep for about one-half distance toward eye, then gradually evanescent. Scape of antennae reaching eye, clavate at apex; funicle as long as scape, seven-segmented, each segment bearing whorl of long white hairs. Eyes round, front between eyes depressed and covered with ferruginous scales. Prothorax as broad as long, sides rounded, disc covered with white and ferruginous scales which are variable in pattern; some with white median line bordered with dark bands. Scutellum conspicuous, with dense white setae. Elytra at base much wider than prothorax; twice as long as broad; striae deeply impressed, punctures concealed; intervals slightly convex, suture elevated toward apex; broad band across suture at middle with numerous spots on other areas; scales white, blackish to ferruginous. Ventral scales white, mixed with ferruginous ones. Femora clavate, toothed; tibiae mucronate at apex; tarsi piceous, clothed with white setae; first two segments equal, third emarginate, slightly wider; claws strong, black. Length 2.9 to 3.1 mm, width 1.3 mm.

Plant relationships. Two specimens were taken in April, 1961; ten in July, 1960; and one in July, 1962, all from *Lycium pallidum* in Area 5.

Subfamily Tychiinae

Tribe Tychiini

Genus *Tychius* Germar

Reference. Germar, 1817:340.

Morphological characteristics. The genus *Tychius* has the following distinctive characteristics: body elongate-oval, with robust recurved setae; eyes large, very nearly circular; head dorsally not constricted behind eyes; antennal

funicle with six segments. Casey divided this genus into four subgeneric groups; *T. prolixus* is the only one placed in the third subgenus which is said to have but six segments in the antennal funicle.

Tychius prolixus Casey

References. Casey, 1892:419; Kissinger, 1964: 57.

Morphological characteristics. *Tychius prolixus* is a blackish, oblong-elongate, convex form; tip of rostrum and antennae pale reddish; vestiture dense, consisting of long, slender subrecumbent squamules on pronotum, pale fulvous in color but whitish along middle and sides; on elytra scales large, dense, rounded, imbricated with some reddish-gray in color; each interval with single series of coarse, recurved, reddish pointed setae. Head with large circular eyes; beak with prominent tuft above each eye; glabrous and shining beyond antennae, equal in length to prothorax. Prothorax wider than long; sides feebly arcuate from base nearly to apex, then rather abruptly constricted. Elytra wider than prothorax and not quite three times as long; sides parallel and straight in basal two-thirds; apex obtuse; depression at declivity. Legs and under-surface clothed with whitish scales. Length 3.3 mm, width 2 mm.

Plant relationship. One beetle was taken from *Astragalus lentiginosus*, Area 17, in June, 1965.

Subfamily Cryptorhynchinae
Tribe Cryptorhynchini

Genus *Zascelis* LeConte

Reference. LeConte, 1876:256-258.

Morphological characteristics. The genus *Zascelis* in the United States is confined to lower California and the southwestern United States. The species are elongate, depressed, coarsely sculptured, pubescent and sometimes scaly. Rostrum long, slender, and extends almost to metasternum. Antennae vary with species. Ventral sutures deep, first one slightly sinuate; first ventral segment longer than second which is equal to third; fourth and fifth equal in length. Mesosternum elongate and deeply excavated almost to base. Femora armed beneath with small tooth; tibia broad, compressed, with row of teeth along anterior margin which is variable in species.

The following is a key to the species of *Zascelis*:

1. Pubescence long, not mixed with scales 2
   Pubescence shorter; tibiae feebly toothed. 3
2. Tibiae very coarsely toothed; length 7 mm ..... *serripes* LeConte
   Tibiae very finely and sparsely toothed; length 4 to 4.8 mm ..... *oblonga* Horn
3. Pubescence short, erect, intermixed with large scales ..... *squamigera* LeConte
   Pubescence prostrate, squastriform and collected in spots on the elytra ..... *irrorata* LeConte

Zascelis irrorata LeConte

Reference. LeConte, 1876:257.

Morphological characteristics. Elongate, black, pubescence fine, short, sparse, prostrate, subsquamiform, and collected in spots on elytra. Rostrum and head densely punctured. Prothorax as wide as long, sides parallel behind, slightly constricted at tip, coarsely punctured, with narrow, smooth dorsal line. Elytra little wider than prothorax, striae composed of large approximate punctures, interspaces narrow, punctured. Femora with small tooth; tibiae feebly serrate, dentate near tip. Ventral surface coarsely punctured; each puncture supports pale, scale-like hair. Length 5.0 to 6.6 mm, width 2.5 to 3 mm.

Plant relationships. Specimens taken are as follows: six in a Pinyon-Juniper community in Area 12: one in August, 1965, and five in July, 1962; and one in a Grayia-Lycium community, Area 1, in August, 1961.

Subfamily Ceutorhynchinae
Tribe Ceutorhynchini

Genus *Ceutorhynchus* Germar

Reference. Germar, 1824:217.

Morphological characteristics. The major characteristics of the genus *Ceutorhynchus* are:

tarsi with two claws; pygidium not excavated but carinate in front with transverse line for reception of tips of elytra; pectoral groove not extending behind front coxae, sometimes wanting, second ventral never prolonged; rostrum longer and slender, usually half length of body; eyes wholly or partially concealed by post-ocular lobes; mesosternum oblique, not sulcate; middle coxal cavities closed within; sternites 3 to 5 unequal; third tarsal segment bilobed.

Ceutorhynchus adjunctus Dietz

Reference. Dietz, 1896:436.

Morphological characteristics. The species *Ceutorhynchus adjunctus* Dietz found in Nevada, Utah, and western Colorado may be separated from *C. horni* Dietz and *C. nodipennis* Dietz to which it is closely related as follows: similar in form, density of scaly covering; size; but different in having paler scales; legs rufotestaceous; elytral interspaces alternately wider, elytral tubercles confined, in the main, to humeral region and summit of declivity; several small tubercles near base of sixth interval; some specimens have small black tubercles on third, fifth, and sixth interval; each tubercle has white, straight seta issuing from its center and point posteriorly; prothorax with prominent cluster of two or three tubercles on lateral margin just back of deep, apical constriction. First segment of funicle twice as long as second, slender and bulbous at distal end, segments 2 to 7 slender; club large, ovoidal acuminate. Legs long, slender, tibiae unguiculate, third segment of tarsi broadly bilobed; claws bifid. Last ventral segment foveate. Length 1.8 to 2 mm; width 1.0 to 1.3 mm.

Plant relationship. All specimens were taken in 1965 from *Stanleya pinnata*—six in Area 12 in August, and two near Cane Springs in June.

Ceutorhynchus tescorum Fall

Reference. Fall, 1907:270.

Morphological characteristics. Body piceous, oval, legs rufous throughout; upper surface clothed with short piliform scales which are yellowish-white in color. Pale scales condensed in pronotal channel and along elytral apices; elongate sutural spot of dense white scales on sutural interval only and about one-fourth length of suture. Under-surface with whitish oval scales; rostrum feebly substriate at base; antennae inserted at middle, funicle six-jointed. Head with pale yellow piliform scales, occiput carinate. Prothorax one-third wider than long, strongly convergent anteriorly, apical constriction moderate, apical margin feebly elevated; pale line in median channel. Elytra wider than prothorax. Striae not deep, intervals nearly flat, vestiture mottled on disc, few dark scales at apex. Femora not toothed; claws with very small basal tooth. Length 2.6 mm, width 1.6 mm.

Plant relationship. One specimen was taken from *Argemone corymbosa*, Area 16, date unknown.

Comments. Fall pointed out that this species may be readily identified due to its six-segmented funicle, simple femora, and toothed claws which form a combination that excludes it from all of the groups indicated by Dietz. It may be placed between the *squamatus* and *septentrionis* groups of that author.

Subfamily Baridinae
Tribe Madarini

Genus *Onychobaris* LeConte

Reference. LeConte, 1876:294.

Morphological characteristics. LeConte characterized the genus *Onychobaris* as containing those species in which the club of the antenna is more oval, entirely sensitive and pubescent, first segment forming less than one-half the mass; second segment of funicle not longer than third; and claws divergent and larger than usual.

In other respects this genus agrees with *Baris* Germar, and the species may be classified similarly, although the front coxae are usually much more widely separated than in *Baris*.

Onychobaris mystica Casey

Reference. Casey, 1892:531.

Morphological characteristics. *Onychobaris mystica* is oblong-oval, convex, densely sculptured, piceous-black; head, rostrum and legs rufus; setae short and sparse. Head punctate toward apex, transverse groove distinctly impressed, polished, impunctate, rostrum especially so at sides, median impunctate line distinct and entire; antenna with second funicular segment rather long, scarcely twice as long as wide but subequal to next two. Prothorax one-fourth wider than long, sides subparallel in basal three-fourths, then strongly rounded and convergent to apex, truncate and distinctly constricted at sides; base subtransverse, median lobe large, prominent, broadly rounded, disc without trace of median line; punctures coarse, evenly placed. Scutellum small. Elytra little longer than wide;

disc with abrupt, deep, coarse and confusedly punctured grooves, intervals flat, narrow, and subequal. Abdomen coarsely and densely punctured. Length 3.7 to 4 mm, width 1.9 to 2.1 mm.

Plant relationship. Seven specimens were taken from *Opuntia acanthacarpa*, Area 5, in June, 1965.

Onychobaris near *depressa* Casey

Reference. Casey, 1892:525-526.

Morphological characteristics. Form oblong-oval; black; legs rufo-piceous; setae short decumbent, whitish, and not abundant. Head finely, densely punctured; impression of rostrum down to origin of scrobes, which are deep and directed below eye. Prothorax wider than long, apex slightly constricted, base transverse, median lobe well developed; no depression of median basal lobe; disc convex, densely punctate; setae short, no median carina; scutellum very small. Elytra longer than wide; disc with fine, not very deep but abrupt striae, intervals with two rows of short, decumbent white setae, row of setae in each stria; punctures dense, not deep. Abdomen and legs densely covered with fine punctures and setae.

Plant relationships. Seven specimens were collected during 1964 and 1965 (Table 10).

Table 10. Collection records of *Onychobaris* near *depressa* at the Nevada Test Site.

Area	Plant Host	Month and Number of Specimens
5	*Stanleya pinnata*	July 1
6	*Chrysothamnus teretifolius*	July 1
16	*Argemone corymbosa*	June 1
17	*Franseria acanthicarpa*	Aug. 1
Cane Springs	*Asclepias erosa*	June 3

Subfamily Rhynchophorinae
Tribe Sipalini

Genus *Yuccaborus* LeConte

References. LeConte, 1876:333-334; Casey, 1892:687-689, 1904:312-324.

Morphological characteristics. *Yuccaborus* is a distinctive genus with an elongate, glabrous body; rostrum straight, as long as prothorax, sculptured beneath with three longitudinal grooves; scrobes short, eyes transverse, contiguous beneath, widely distant above, not extending to upper surface of head. Antennal scape reaching eyes; funicle six-segmented, seventh forms corneous shield on basal part of club. Prothorax longer than wide, slightly narrower at tip than at base, constricted. Scutellum, small, rounded. Elytra with shallow punctured striae, intervals wider, sparsely punctured; rounded at tip, pygidium slightly exposed. Legs slender, femora not clavate, tibiae feebly serrate on inner side, especially front pair; inner angle unguiculate; tarsi slender, third segment bilobed, not spongy beneath, but smooth and glabrous like others.

The outstanding characters of this genus are: eyes contiguous beneath and widely separated above; antennal club is corneous sheath; small third tarsal segment not spongy beneath.

Casey (1892) described three species and proposed the following key which may be used to separate them from *Y. frontalis*. I have added *lentiginosus* Csy. (1904) to the key:

1. Piceous-brown, punctation of the upper surface finer and more remote 2

   Black, much larger, coarsely and deeply sculptured; legs and tarsi stouter ..... *grossus* Csy.

   Black, smaller, finer and less deeply punctured; many of the punctures surrounded by pale yellowish-white spots, legs moderate, shining, finely punctate ..... *lentiginosus* Csy.

2. Body narrowly cylindrical, the elytra more than twice as long as wide; punctures of the elytral series becoming very fine and feeble in apical half as usual; fifth and sixth series coalescent at base; humeri tumid and prominent ..... *frontalis* Lec.

   Body much more robust, the elytra not quite twice as long as wide; punctures of the elytral series deep throughout, although small in apical half as usual; fifth and sixth series widely separated at base; humeri not tumid ..... *sharpi* Csy.

I have studied specimens of this genus from Arizona, Nevada, and California, and agree with Sleeper (1960) that Casey's *Y. grossus* is a valid species. The Nevada and Arizona specimens fit LeConte's description of *Y. frontalis*. *Yuccaborus sharpi* Casey is a Mexican species. *Yuccaborus lentiginosus* specimens, due to the "elytra dull and with many of the punctures of the intervals surrounded by a pale yellowish-white modification of the surface, the punctures along each side of the pronotum also so affected," smaller in size, with finer sculpturing and elytra only a fourth wider than the prothorax separates it as a species, in my opinion, from *Y. grossus*.

Anderson (1948) reports that Barber considered the galleries of *Y. lentiginosus* similar to *Dendroctonus*. On the basis of the larvae, Boving and Craighead (1931) were able to separate the Curculionidae and Scolytidae. Crowson (1955) includes the Scolytidae and Platypodidae in the family Curculionidae.

Yuccaborus frontalis (LeConte)

Reference. LeConte, 1874:70.

Morphological characteristics. Body black, shining; head sparsely, coarsely punctured, rostrum straight, as long as prothorax, coarsely and densely punctured, sulcate and sparsely setose each side; frontal fovea distinct. Eyes contiguous beneath, widely separated above; prothorax longer than wide; apex tubularly constricted, disc coarsely but not densely punctured. Elytra with rounded humeri, sides parallel, striae finely punctured, intervals flat, with few small punctures; lateral margins and under-surface of prothorax densely and coarsely punctured. Legs slender, front tibiae with several small teeth on inner edge. Length 12.5 to 14.2 mm, width 4.9 to 5.5 mm.

Plant relationship. Five specimens were collected in a mixed community, Area 23, in August of 1961, 1964, and 1965.

NOTES ON THE BIOLOGY OF SOME NEVADA TEST SITE WEEVILS

The life histories and host plants of the weevils of the Great Basin are poorly known. In this study an attempt was made to bring together information on the biologies of the weevils of this report. Many of the species dealt with are represented by one or not more than three or four specimens. This, no doubt, is due to lack of intensive collecting, such as beating and sweeping of the shrubs and smaller plants. The apterous species found on *Atriplex*, *Coleogyne*, *Grayia*, *Larrea*, *Kochia*, *Lycium*, *Franseria* and other shrubs of the area are not easily collected by traps or lights. They are taken mainly by beating or close examination of the plants and by hand picking.

I have searched the literature to find the recorded host plants of the species discussed in this study but have met with little success. What information I have gleaned from the literature or the field notes taken at the Nevada Test Site are presented here.

Species of *Trigonorhinus* (*Brachytarsus*) were reported by Blatchley and Leng (1916) as breeding in stored corn, peas, and cowpeas; stems of wide rye and in the smut of corn and wheat; also taken on ragweed, *Ambrosia artemisiaefolia*, and from the pod of the bladdernut, *Staphylea trifolia*. According to Valentine (1960), "*Trigonorhinus* species are plant feeders like the majority of the family, but the generically distinct Old World species of *Anthribus* Foster, 1771 (formerly *Brachytarsus* Schoenherr, 1823), have larvae which are predaceous on the eggs of certain lecaniine scale insects." The specimen collected at Mercury was on burr-sage, *Franseria acanthicarpa*.

No reports of plant association for the species *Thinoxenus nevadensis* and *Thricolepis inornata* have been found in the literature. At the Nevada Test Site *T. nevadensis* was taken in a Pinyon-Juniper Community, but the specific host plant is unknown. *Thinoxenus inornata* was taken on Gamble oak at the test site; it is common on oaks in Utah. The *Eucyllus* species at the test site are wide-spread in most of the communities. One specimen was taken on winter-fat, *Eurotia lanata*. I have not found any reference to the host plants for this genus. *Aragnomus hispidulus* specimens were taken on *Coleogyne*, *Grayia*, and *Larrea* plants. No other references to plant hosts for this species have been found. Van Dyke reported collecting *Aragnomus setosus* by beating manzanita.

The *Cryptolepidus* species are typical of this xerophytic region. Some of the species such as *C. leechi*, *C. planifrons*, and *C. rugicollis* were reported by Ting (1940) as living on *Atriplex* and *Sarcobatus vermiculatus*. At the test site *C. leechi*, *C. nevadicus*, *C. aridus*, and *C. cazieri* were taken in *Atriplex* associations. One speci-

men of *C. nevadicus* was taken on evening primrose, *Oenothera californica.*

Other short-nosed weevils of the genera *Ophryastes, Orimodema, Paracimbocera, Miloderus,* and *Dirotognathus* are closely associated with the desert flora of the Great Basin. Fall, Van Dyke, Casey, Horn, and Davis, however, did not record plant hosts for this complex. Ting (1940) collected the holotype female of *P. artemisiae* on *Artemisia* sp. *Ophryastes varius* and *O. geminatus* are common species on *Larrea divaricata* and *Atriplex canescens* in the test site area as well as areas of the Great Basin where these plants are found. Collier, according to Ting (1940), observed *Paracimbocera artemisiae* injuring the twigs of apple trees in Grand Valley, Colorado, in April, 1911.

Orimodema protracta and *Dirotognathus sordidus* were collected in the Pinyon-Juniper community, but a definite plant host was not determined. *Miloderes mercuryensis* was collected on *Sphaeralcea ambigua* and *Grayia spinosa.*

One-half of all the specimens of weevils considered in this study are *Cleonus denticollis* which was described from a series of five specimens collected at Peach Springs, Arizona. Casey (1891) did not indicate with what plants this species may be associated. The tribe Cleonini has adults of many species associated with water plants. According to Blatchley and Leng (1916) the larvae feed upon different kinds of *Polygonum* (smartweed) and other plants such as dock, ragweed, and wild sunflower. More than a hundred specimens of *C. denticollis* were collected in the Grayia-Lycium community, and some specimens were taken on *Hymenoclea fasciculata* and *Larrea* sp. at the test site.

The host-plant records for *Smicronyx imbricatus as reported* by Anderson (1962), follow: *Gutierrezia lucida, Pluchea sericea, Chrysothamnus speciosus, Prosopus juliflora, Covillea tridentata, Pinus edulis,* and *Pinus monophyllum.* This species is common in the Mercury area, and Table 6 shows the wide variety of plants in most of the communities upon which *S. imbricatus* feeds. *Promecotarsus densus,* which is included in the subtribe Smicronychini, has similar food plant preferences to that of species of *Smicronyx,* having been collected on *Artemisia tridentata* and *Juniperus osteosperma.*

Larvae of species of the genus *Apion* were reported by Blatchley and Leng (1916) "to feed, for the most part, on seeds, principally those of legumes, though some form galls on the stems and leaves of plants, others knots on the roots, while a few bore into the pith and form a kind of cocoon of the gnawed particles." Specimens of *A. sordidum* are reported as forming galls on *Artemisia.* Specimens of *A. varicorne,* which is a wide-spread and variable species, were taken on *Dalea polyadenia* and *Eriogonum nodosum.*

Species of *Auletobius* are reported by Blatchley and Leng (1916) as occurring on sweetfern, *Comptonia perigrina,* bayberry, *Myrica cerifera,* and leather-leaf, *Chamaedaphne calyculata.* At the Nevada Test Site *A. humeralis* was collected on *Ephedra nevadensis. Auletobius* sp. was also found on *E. nevadensis* and *Chrysothamnus viscidiflorus.*

Myrmex l. lineata was collected in a *Larrea* community.

Magdalis lecontei tenebrosa was collected on *Pinus monophylla* at the test site. Buchanan (1934) described *M. piceae* from specimens reared from Colorado blue spruce, *Picea pungens glauca.* All the species of *Magdalis* breed in the bark and wood of various coniferous and deciduous trees.

All the species reported in the tribe Anthonomini in this study breed and feed in the seeds of plants. Blatchley and Leng (1916) record them as living in the buds, flowers, fruits, and seeds of plants. Some species are plant-gall formers. The larvae pupate in the feeding cell instead of entering the ground. *Macrorhoptus hispidus* was collected on *Sphaeralcea* sp., *Grayia spinosa* and *Artemisia* sp. at the test site. *Anthonomus peninsularis* was collected on *Sphaeralcea* sp. and *Ephedra nevadensis; A. haematopus confusus* occurs on *Juniperus* sp. and *Artemisia tridentata; A. ornatulus* was collected on *Eurotia lanata; A. sphaeralceae* was found on eight different plant species (Table 8); *A. cycliferus* was collected on species of *Chrysothamnus, Artemisia* and *Chaenactis; A. tenuis* occurs on five different plant species at the test site. *Epimechus gracilis* was taken from *Chrysothamnus viscidiflorus. Brachyogmus ornatus* breeds in the flowers and seeds of *Lycium pallidum* at the test site.

Tychus prolixus was collected on *Astragalus lentiginosus* at the site. *Zascelis irrorata* occurs in the Juniper and Grayia-Lycium communities. Ceutorhynchini species, both native and introduced, are found in mesophytic to hydrophytic conditions. The larvae feed on "seeds, seedstalks, or the stems of plants" (Blatchley and Leng, 1916). At the test site, *Ceutorhynchus adjunctus* was collected on *Stanleya pinnata* and on an unknown plant species near Cane Springs. *Ceutorhynchus tescorum* was collected on prickle-poppy, *Argemone corymbosa.*

The genus *Onychobaris* in the tribe Madarini is represented by two species in this report. Species of this genus are found mainly in the western dry desert regions. Fall (1913) reports that he has taken *O. densa* on "flowers of a low fleshy-leaved plant just above the beach near San Diego." Seven specimens of *O. mystica* collected in Area 5 at the test site were on *Opuntia acanthacarpa*. Specimens of *Onychobaris* sp. near *depressa* were collected on five different species of plants (Table 10).

LeConte (1874) described *Yuccaborus frontalis* from a specimen found under a bark of Yucca in the Mohave Desert. At the Nevada Test Site this species was collected in a mixed community.

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